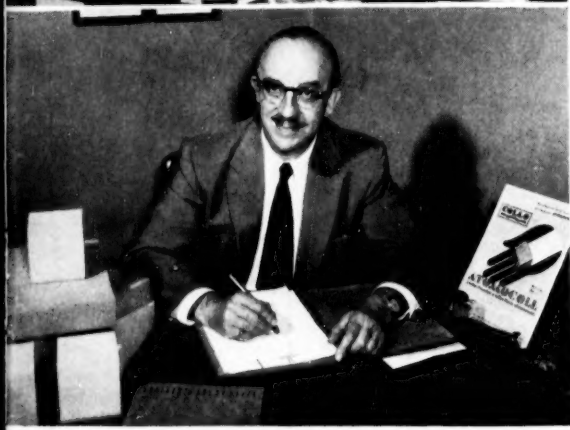


Chemical Week

September 4, 1954

Price 35 cents



- Cleveland industry prospects reshaped by soon-to-be-built seaway; boom ahead? . . p. 18

Now plant men can use all the information they get; the key: digital data logging . . . p. 40

- Diamond Alkali's sales analyzers pinpoint sales aims, boost their staff's productivity p. 52

From nuclear reactors to novel esters, boron moves fast into new, research-spawned jobs . . p. 62

- American Collo's Seligmann: one of many banking on a boom for polyurethane foams . . . p. 82

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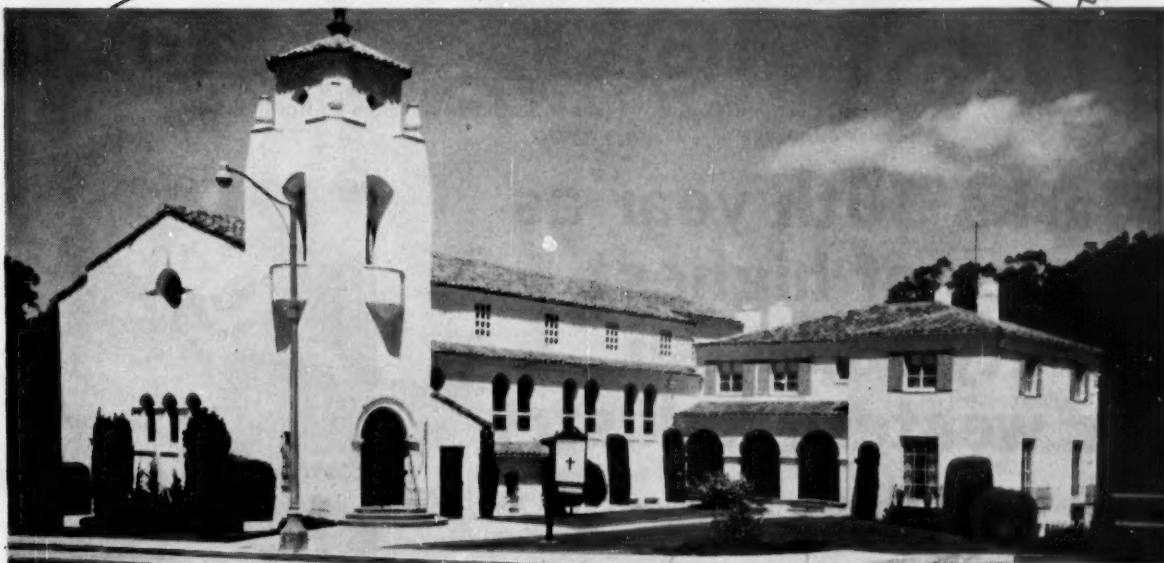
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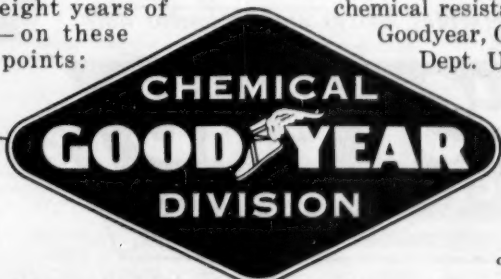
IT used to be that painting masonry was a big problem—and a big risk—to everyone concerned. Over and above the usual enemies of paint—weather, mildew, fumes and airborne dirt—were the ever-present alkalis and inherent moisture which often attacked and destroyed conventional paints in a few short months.

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Chemical Week—

Volume 75

September 4, 1954

Number 10

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Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), founder. Publication Office: 1309 Noble St., Philadelphia 23, Pa.

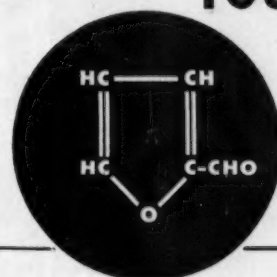
Executive Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.
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Subscriptions to Chemical Week are solicited in the chemical and process industries from management
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indicated on subscription order. Address all subscription communications to Chemical Week Subscription
Service, 1309 Noble St., Philadelphia 23, Pa., or 330 W. 42nd St., New York 36, N. Y. Allow one month
for change of address.

Single copies 35¢. Subscription rates—United States and Possessions \$5.00 a year; \$8.00 for two years; \$10.00 for three years; Canada \$6.00 for a year; \$10.00 for two years; \$12.00 for three years. Other Western Hemisphere
and the Philippines \$15.00 a year; \$25.00 for two years; \$30.00 for three years. All other countries \$25.00 a year;
\$40.00 for two years; \$50.00 for three years. Entered as second class matter December 20, 1951 at the Post office at
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September 4, 1954 • Chemical Week

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Surface Tension at 20°C. (dynes/cm)	49.
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54°C.	1.09

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OPINION

Boon, Not Bane

TO THE EDITOR: Several of our people have called my attention to your news story, "Synthetic Sore Spot" (July 24). This article makes some statements that we believe are incorrect but more seriously seems to infer that soaps and/or synthetic detergents are dangerous products. Actually, they are a boon to mankind and are usually considered essential from a health viewpoint. Instead of soaps "being rated among the leading causes of occupational diseases" they are usually considered one of the greatest preventives. . . .

. . . plenty of authorities have agreed that cleanliness is the best preventive of industrial dermatitis and urge better washing facilities, employee training programs, etc. . . .

ROY W. PEET
Assn. of American Soap &
Glycerine Producers, Inc.

New York

We certainly have no quarrel with Reader Peet. We simply skipped the obvious—that soap and detergents combat dermatitis by promoting cleanliness—and stressed the published references to "harsh detergents" and "detergent burn" to point up a problem currently facing soap and detergent makers. Some people do react unfavorably to some detergent ingredients, it must be conceded, but "in the majority of people, of course, there is no irritation," as we said.—Ed.

Graphic Sciences

TO THE EDITOR: Your "Quiet Boom in Association Research" (July 10) was particularly interesting to me. Few of us appreciate the extent to which association research is being carried on.

I think it worthwhile to call your attention to the awakening in the graphic arts industry to research of a technical nature because it is a relatively recent development in a very old industry. There are, among the association type of research projects going on at the present time at various institutes, work on photo engraving by Photo Engravers Research, Inc., on gravure printing by Gravure Research, Inc., on electrotyping by Printing Plates Research, Inc.; and the more recent development of the Photon photographic typesetting machines at the Graphic Arts Research Foundation in Cambridge, Mass., is a cooperative affair supported by a number of graphic arts companies.

The total expenditures for all these projects may be small in comparison with the expenditures within the chemical industry, but they do represent a significant trend and a switch from the graphic arts to the graphic sciences. They should be watched.

MARVIN C. ROGERS
Research Director
R. R. Donnelley & Sons Co.
Chicago

Who's on First?

TO THE EDITOR: You state (July 3, Newsletter) that powder dispensing is the latest thing in aerosols. You also state that Aeropak, Inc., Chicago, has licked the valve problem and has come up with a device for spraying 300-400 mesh powders.

We believe that we were the first people to explore the dry powder aerosol field, and we have gone very cautiously because of the difficulties encountered in spraying powders by this method.

We believe that our zinc stearate mold duster, on which we are enclosing data sheets for your information, is the first commercial application and indeed the first successful application of a dry powder aerosol. . . .

A. R. MORSE
Sales Engineer
Injection Molders Supply Co.
Cleveland

Our July 3 Newsletter paragraph should have made it clear that the development therein described was reinforcing a trend. Reader Morse's zinc stearate mold duster was described three weeks earlier (June 12, p. 68).—Ed.

Research and Testing

TO THE EDITOR: . . . Your report on trade association research activities (July 10) might be construed as indicating that so-called nonprofit research foundations monopolize that work. And your comment in reply to the letter of Mr. Lewis E. Harris (Aug. 7), that the services of commercial organizations are utilized in the main for testing and consultation, is not our experience.

The independent privately owned research laboratories, such as the American Council of Independent Laboratories, are in there pitching, too. We, among others, have done substantial research—not just testing or consultation—for quite a number of associations, e.g., American Society of Heating and Ventilating Engineers,

American Spice Trade Assn., etc., etc.

FOSTER DEE SNELL
President
Foster D. Snell, Inc.
New York

As we said in commenting on Reader Harris' opinion—we're both right. On the whole, commercial labs do a good deal of testing and consulting—and some research—for trade associations; but the bulk of the gain in association research, as we reported, has gone to the institutes.—Ed.

Tall Oil History

TO THE EDITOR: Referring to your interesting article, "Tall Oil Tempo Quickens" (May 8), I take the liberty to contribute some tall oil history, which is part of a talk delivered by Techn. Lic. C. O. Gabrielson, managing director of Mo-Domsjö A/B's research laboratory, Ornskoldsvik, Sweden, to the Finnish Paper Engineers Assn. about "Wood Chemical Industry in Sweden."

"The recovery of crude tall oil was started in Sweden in 1902 by E. Larsson. Further refining through distillation started in Kotka, Finland, in 1913, where Alfons Hellstrom was the great pioneer. In Sweden, Hilding Bergstrom worked on the same problem during World War I with indifferent success. The permanent solution of the difficulties was not reached until 1920 in Finland and 1930 in Sweden.

In 1902 Larsson called the oil tall oil (tall = *Pinus silvestris*) but when the best chemists of Europe decided it was rosin in liquid form, it was consequently called liquid rosin. When Bergstrom discovered in 1910 that liquid rosin consisted of about 50% fatty acids, the oil got its original name back.

The first distillation patent in the world, which consists of distillation with steam under vacuum, the crystallization of the rosin and its separation through centrifugation, was obtained in Finland in 1911 by Hellstrom and Bergstrom. In 1914, [they] exhibited the distilled tall oil, tall-oil rosin, tall

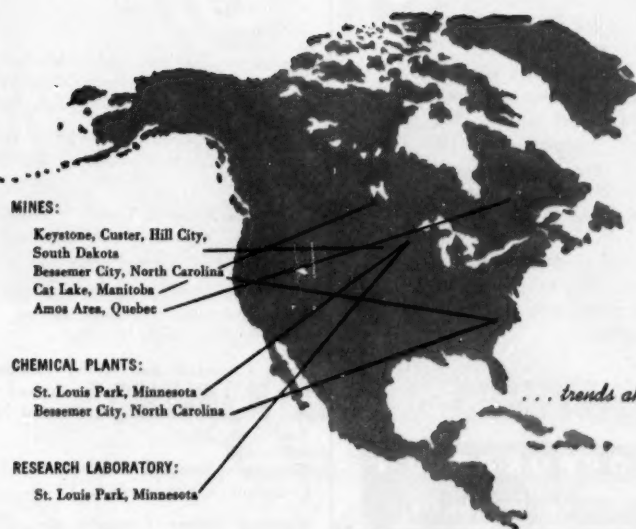
CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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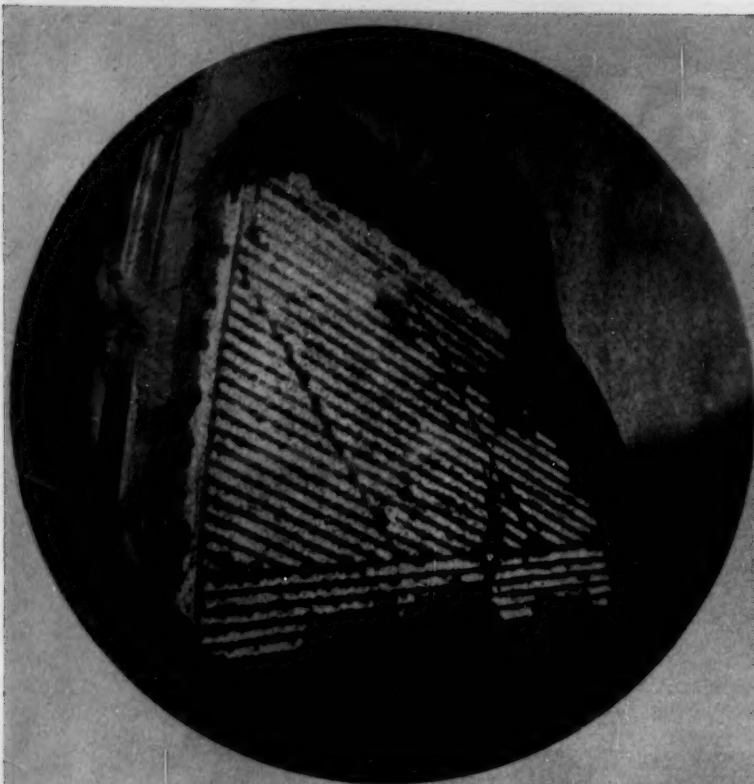


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OPINION

pitch, soap, varnish, etc., at the big Baltic exhibition in Malmo, Sweden. These products Hellstrom had manufactured with the help of a pilot plant at Enso-Gutzeits' sulphate pulp mill in Kotka, Finland.

In Aug. 1914, a tall-oil distillation and hard soap plant was to be built on an industrial scale in Kotka, but it was impossible to get pure aluminum in Finland during World War I; thus the start had to be postponed until 1920.

Since then Hellstrom has built eight tall-oil distillation plants in Norway, Finland, Sweden and Russia (1936) of which five were combined with hard soap plants.

Commercially, the start was difficult in 1920 as Finland was flooded with good and cheap hard soap from the Allies' war stock. But the popularity of Hellstrom's tall oil hard soap . . . and its payability enabled a fast expansion of the factory in Kotka from a yearly crude tall oil distillation capacity of 500 tons to 12,000 tons."

ALFONS HELLSTROM
Ingenior-Kemist
Kotka
Finland

DATES AHEAD

National Agricultural Chemicals Assn., annual meeting, Essex and Sussex hotel, Spring Lake, N.J., Sept. 8-10.

International Congress of Industrial Chemistry, Brussels, Belgium, Sept. 11-19.

American Institute of Chemical Engineers, national meeting, Colorado hotel, Glenwood Springs, Colo., Sept. 12-16.

American Chemical Society, national meeting, Statler hotel, New York, Sept. 12-17.

American Assn. of Textile Chemists and Colorists, national convention, Atlanta Biltmore hotel, Atlanta, Ga., Sept. 15-18.

Chemical Market Research Assn., fall resort meeting, Equinox House, Manchester, Vt., Sept. 20-21.

Drug Chemical and Allied Trades Section, N.Y. Board of Trade, annual meeting, Pocono Manor Inn, Pocono Manor, Pa., Sept. 23-25.

National Chemical Exposition, Chicago Coliseum, Chicago, Oct. 12-15.

National Safety Congress and Exposition, chemical section, Chicago, Oct. 18-21.

Assn. of Consulting Chemists and Chemical Engineers, annual meeting and symposium, Belmont Plaza hotel, New York, Oct. 26.

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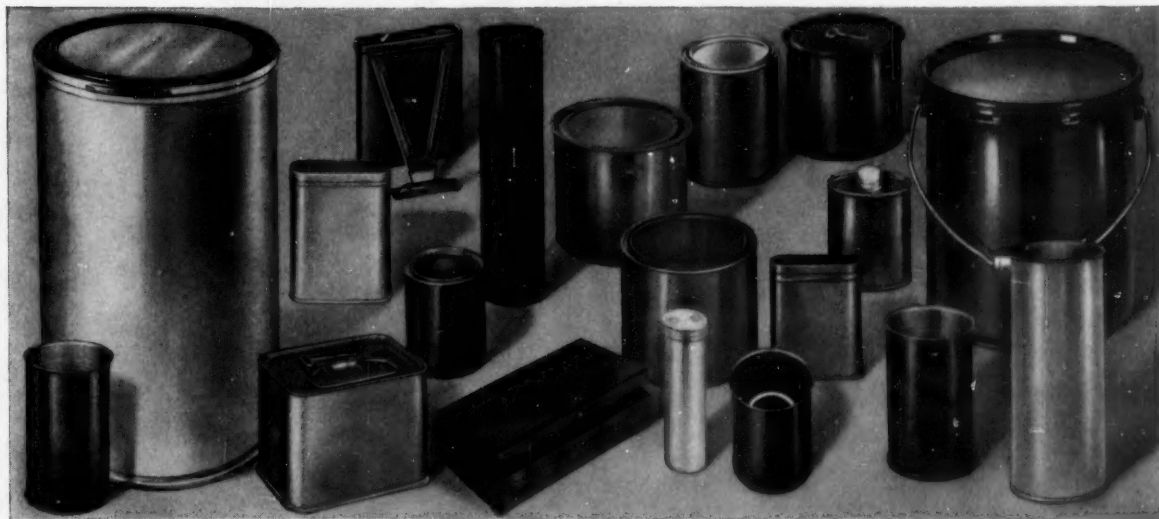
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NEWSLETTER

The long-range business outlook is promising, Dow Chemical's President Leland Doan told the company's stockholders last week. "Our economy cannot be expected to travel indefinitely at supersonic speed," he pointed out, "but something short of this can still represent a very satisfactory rate of progress."

Dow's fiscal six months' sales, pretax earnings and net all slipped. Doan conceded that plants are not all operating at capacity, pointed out that the firm's \$600-million expansion over the past eight years was partly based on anticipated but unrealized defense demands.

But looking ahead, Doan is confident. "We're going to have profitable use for all our present capacity and much more besides."

Corroborating Doan's optimism is Dow's latest move: construction of Styrofoam (foamed polystyrene) facilities at Allyn's Point, Conn., to supplement current capacity, which is confined to Midland, Mich. The Connecticut location was chosen because of the large market along the Atlantic Seaboard.

Other firms, too, were on the move last week:

- Tide Petroleum Products, Edinburg, Tex., has sold its retail service station outlets to Continental Oil, will use the money to expand its business in LP-gas, lubricants, fertilizers, insecticides, fungicides, weed killers, defoliators and soil fumigants.

- Field construction started this week on Stanolind's refurbishing of its recently acquired Carthage Hydrocol plant. But contrary to talk that has been going around, the plant is not being converted to ammonia production nor are such plans actively in the works. Stanolind does, however, recognize ammonia production as a future possibility.

The tempest stirred up by an unsuccessful bidder led last week to charges of incompetency against the Army Chemical Corps by a House subcommittee headed up by Rep. William E. Hess (R., Ohio).

Air-A-Plane Corp., Norfolk, Va., complained that its \$607,000 low bid to supply 1,157 smoke generators was rejected in favor of the fourth-lowest bid, which was some \$93,000 higher. Air-A-Plane's bid was rejected on the grounds that the company lacked financial ability, space, working force and tools to discharge the contract. The Small Business Administration looked into it, charged that the New York chemical procurement office based its information on "trick questions, half truths, omissions and distortions."

The Chemical Corps reversed its decision two weeks after SBA cleared the firm, and the subcommittee now calls on the Corps to "institute more adequate training" for its investigators.

The subcommittee report points out that "if this matter had not been brought to the subcommittee's attention, this bidder would have been eliminated and no one but the preaward surveyors would have known what had happened. . . . Distortions concealing incompetency would have deceived the contracting officer who had to rely on them; and it would have cost the government 15% more for this procurement."

Legal troubles of a different sort are besetting U.S. Steel. Five additional damage suits, each seeking \$100,000, were added last week to the 11 already filed at the U. S. District Court in Utah.

All plaintiffs are owners of farms near USS's Geneva plant (CW, June 7, '52, p. 24). They allege that fluorides in the plant's stack gases are causing plant and livestock damage, and they're asking for an injunction banning further Geneva operations.

•

Stanley Barnes, the Justice Dept.'s antitrust chief, is casting a jaundiced eye at the recent rash of mergers (involving chemical process as well as other industries). He fears the creation of monopolies and a lessening of competition.

Chemical management's reaction to Barnes' remarks: What's legal? Antitrust operation is curious in that a firm may consult the Justice Dept., the potential prosecutor, to learn whether a contemplated move is legal. But even if the department grants approval, that's no guarantee of immunity from future prosecution. "We reserve the right," says Barnes, "to observe how it works in practice."

•

The August dog days may have been responsible for these verbal battles, but they didn't stop industry progress:

- Carbide and Carbon Chemicals is now readying one of the largest OXO units in the world at Texas City; it will turn out some 60 million lbs./year of alcohols, aldehydes and acids synthesized by the high-pressure (1,500-6,000 psi at 200 gc) reaction of carbon monoxide and hydrogen with olefins ranging from ethylene to 15-carbon hydrocarbons. Now in the pilot plant at Charleston, W. Va., awaiting completion of the commercial plant are iso-octyl, primary decyl and primary tridecyl alcohol. Foreseen outlets: plasticizers, detergents, polymers, etc.

- Western & Pyromet has signed a 10-year lease with General Services Administration to take over the government's silicothermic magnesium plant at Manteca, Calif., for titanium production. Pilot plant work will start this month, and the goal by the end of '56 is 6,000 tons/year.

•

Meanwhile, "no money" is the reason why the Bureau of Mines is quitting titanium production at Boulder City, Nev. Titanium research, however, will be continued.

Aero Metals, Inc., sees a better chance for its titanium project (CW Newsletter, Aug. 28) now that BofM is pulling out. It has upped its application with GSA to a \$2.5 million, 3 tons/day plant instead of a \$1-million project.

•

Here's solid evidence of Southern chemical growth—as if any further were needed: in Virginia, employment in the chemical industries for the first time surpassed that in textiles—42,000 vs. 40,700.

And in Lake Charles, La., there's talk about a possible Gulf States petrochemical exposition to play up the growth of the industry in that area. It's still in the planning stage, but it has the backing of local chemical men and other industrialists.

•

Vandalism at Sharp & Dohme's Glenolden, Pa., research laboratory caused researchers to set up a watch, see who was removing—without a trace—record information cards attached to cages of some 1,000 experimental mice. The culprit: An outside mouse—no kin to the research animals—who was sneaking up at night, grabbing the cards and disappearing.

. . . The Editors

...TO PROTECT YOUR HEALTH



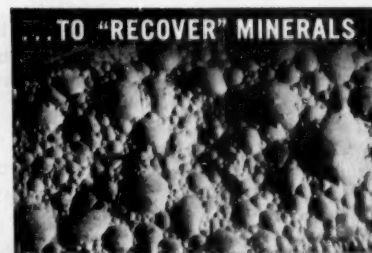
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BUSINESS & INDUSTRY. . . .



WIDE WORLD

CHAIRMAN BROSSARD: For embattled industries, a sympathetic ear.

Duties and Distress

Quickening interest in the lot of U.S. industries being hurt or endangered by competition from foreign imports is being shown by Congress—as evidenced by the Senate Finance Committee's request that the Tariff Commission study the fluorspar industry, along with fluorspar imports and their prices and effects.

This keener concern for domestic industries threatened by low-cost imports—such as certain sections of the organic chemical industry—appears to stem partly from stepped-up exporting by foreign companies, partly from the fact that Congress is now confronted with the recommendations of a Republican President that tariff rates be lowered to stimulate international trade. To chemical firms, it's noteworthy that the first subject of a Senate-prescribed investigation by the Tariff Commission is a basic raw material.

Fluorspar producers in the U.S. have been in moderate to severe trouble for the past year or more, with a number of facilities shut down. One major producer, Ozark-Mahoning, asked for an investigation last fall under the escape clause of the Reciprocal Trade Agreements Act; but shortly after the Tariff Commission started that probe, Ozark-Mahoning withdrew its application, possibly because of some confusion over the different types

of fluorspar. (Tariff on acid-grade spar was reduced under the Reciprocal Trade Act; hence a domestic producer could object under the escape clause and get an investigation. Tariff on metallurgical-grade fluorspar, however, remains as high as it was under the 1930 Smoot-Hawley law; so there's no way for a producer to get higher duties or penalties through escape clause proceedings.)

Pressure from Voters: The present probe—requested by Senator Eugene Millikin (R., Colo.) and his committee just before Congress adjourned—has nothing to do with escape clauses *per se*, so Tariff Commission Chairman Edgar Brossard can lend a sympathetic ear to problems on both acid and metallurgical grades. Presumably, the intent is to determine whether the 84th Congress should hike customs rates on fluorspar.

It's known that constituents have been pleading for help from several congressmen and senators who represent fluorspar producing regions, among them Rep. C. W. Bishop (R., Ill.). If this investigation proves helpful to fluorspar firms, it can be expected that other industries will press for similar treatment.

Tariff Pinch

Contrary to the earnest wishes of those who look to increased world trade as a preventive of world war, a gradual shrinkage is seen this week in the number of chemical commodities in channels of international commerce.

One straw in the wind: an announcement by the British Board of Trade that eight chemical products are being scratched off the list of items that can be exported into the United Kingdom without running into the special "key industry" duty. That list of privileged products still carries the names of several hundred chemicals, but their exempt status is now guaranteed only to next Feb. 18, and it's to be expected that this number will dwindle steadily as Britain's domestic chemical industry builds up its production capacities. For phthalic anhydride, exemption from the key industry duty runs only to Nov. 18. One item added to the exempt list: diethylene glycol monobutyl ether.

Another instance of the pinch of protective tariffs: Belgian chemical producers are complaining that their

sales calculations are upset because a hoped-for liberalization of U.S. tariff policies has not materialized. The Belgians point out that the three big increases in their 1953 chemical exports to the U.S. are not likely to be repeated; new plants will boost U.S. production of nitrogen; the spurt in phthalic anhydride shipments was due to a strike against a major U.S. producer; and the big jump in radium salts reflected equipping of a new cancer therapy unit in New York City.

Unions' Hurdle

At least three labor unions that have locals at chemical plants are likely to run afoul of the new Communist control bill signed by President Eisenhower last week. To chemical companies concerned, this could mean considerable industrial strife—mostly between rival unions—that might disrupt production schedules.

The new law says that a union that has aided the world Communist movement within the past three years, or which is controlled by pro-Communist officers, can no longer qualify for services of the National Labor Relations Board. Thus ineligible to take part in NLRB elections and representation proceedings, such unions are likely to be attacked by "right-wing" rivals, while production work suffers.

Left-wing unions in the chemical industries are notably the International Union of Mine, Mill & Smelter Workers; the United Electrical Workers; and Harry Bridges' International Longshoremen's & Warehousemen's Union.

Plea of Innocence

Whether paintmakers and suppliers have been subjected to coercion in an alleged attempt to keep them from selling to certain retailers will be argued in soon-to-be-scheduled hearings before a Federal Trade Commission examiner.

Defendants in this case are the Brooklyn Paint & Wall Paper Dealers Assn. and its approximately 200 members. Date and place for the hearings will be set soon, now that the association has replied to the FTC complaint charging a "conspiracy to restrain trade."

The Brooklyn group denies that there was any conspiracy or coercion.

More Freedom for Chemical Freight

Chemical and pharmaceutical products that are:

STRICTLY CONTROLLED—

may be shipped only to friendly nations; export license required. . . .

barium nitrate, borates, carbon black, cobalt compounds, dinitrotoluene, gamma globulin, glycols and other industrial organic chemicals, hydraulic fluids, hydrazine, picric acid, polyethylene plastics, organo-fluorine compounds, tetraethyl lead.

RECENTLY DECONTROLLED TO SOME EXTENT—

may be shipped without license to friendly nations; exporters now may apply for licenses for shipping to Soviet nations in Europe

all antibiotics, most coal-tar chemicals, liquid gum inhibitors permanganates, phosphoric acid, malarial drugs rubber compounding agents, sulfonamides.

UNRESTRICTED—

may be shipped anywhere in the world

(no products in this category, because shipments to Communist countries in Asia are prohibited).

Big Pipe, Little Flow

The valve on this end of the trade-and-commerce pipeline to the Soviet nations in Europe has been opened a little bit more; but it's not likely that the Soviets will pump any large amount of U.S. chemicals into their domains.

At the request of this nation's NATO allies, the U.S. has agreed that hundreds of items—including dozens of chemicals and pharmaceuticals—can be added to the list of products that are permitted to be sold to Russia and the Soviet satellites in Europe: Poland, East Germany, Czechoslovakia, Hungary, Rumania and Albania. There's no change in the general ban on shipments from the U.S. to Communist China, North Korea, and the Vietnam portion of Indo-China.

But there are three towering reasons for expecting that the flow of U.S. chemicals to the Soviet sphere won't be much more than a trickle:

- Products that are newly eligible for shipment into the Russian orbit

have virtually no "war potential" and only modest industrial importance, hence are not particularly valuable to the Moscow rulers.

- Most of the items dropped from the Commerce Dept's "positive list" are goods that already are being produced in quantity in the Iron Curtain countries.

- The heavily industrialized nations of western Europe also are now free to ship these products into the Soviet zone; and for both political and economic reasons,* the Communists generally would prefer to buy from European countries than from the U.S.

Small Sales Pickup: Even the West European chemical companies probably won't be able to increase their East European sales very much as a result of this revision in commodity

* European-made goods usually are less expensive because of lower production and transportation costs and "soft" currency; and current Communist policy calls for trading with West European nations as a means of making those countries feel that it's more profitable to be chummy with the U.S.S.R. than with the U.S.

classifications. The Communist countries are self-sufficient in many of these products right now and are, of course, striving for self-sufficiency in all materials; the Communist countries are rigidly limited as to what they can export in return; and many major chemical and pharmaceutical products are still not permitted to be shipped into the Red orbit (see table, left, for examples).

In fact, some items are being added to the embargo list; only recently, for instance, the Commerce Dept. put borax and boric acid on its positive list. Also, while the 16-nation trade conference in London voted to expand the number of products that may be sold to the Soviets, it also adopted plans for stricter enforcement of the ban against shipment of other items.

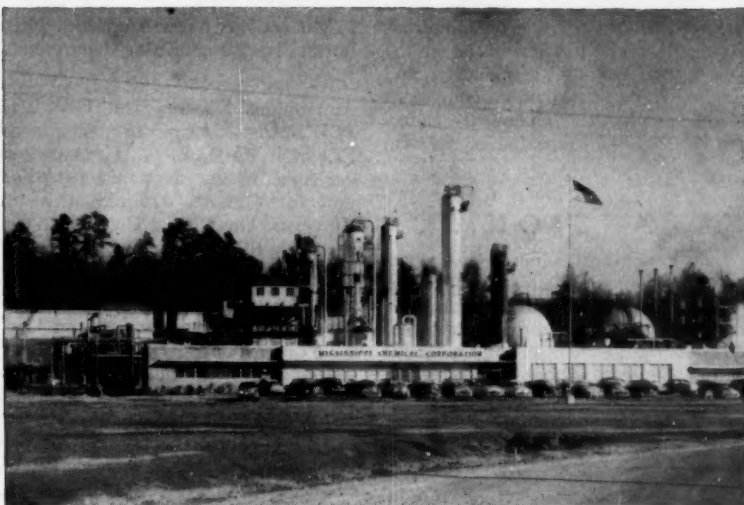
Commerce Secretary Sinclair Weeks and Foreign Operations Administrator Harold Stassen, in announcing the changes, reiterated that the U.S. and its allies are continuing the policy of preventing the export to the Soviet bloc of goods that would build up its military potential. Under that policy, it's not to be expected that any sizable trade in chemicals will spring up overnight.

Shields Stay Shiny

Anxious to prevent U.S. defense industries from getting rusty and out of operating condition, the Office of Defense Mobilization is launching a program to put vital defense plants on standby basis. Estimated cost of this program after it goes into full effect: several hundred million dollars/year.

To a large extent, this program will apply directly to hard-goods manufacturers rather than to chemical companies. Defense procurement agencies—Dept. of Defense, Atomic Energy Commission, and Maritime Administration—will sign "maintenance" contracts with certain plants that are likely to be needed for quick conversion to military production in case of national emergency. Such contracts are to cover essential war goods that usually require considerable time for production start-up; those not currently in production or that would be needed in much larger than peacetime quantities; and those requiring special materials or processes.

These contracts will provide for physical maintenance of facilities and retention of key scientific and technical personnel, may also include some research and development. Incidental aspect: the program's continuing need for preservatives and other chemical specialties.



NOW ONSTREAM: Mississippi Chemical's additional ammonia facilities boost capacity to over 180 tons/day.

Picking Up Momentum

Often lost in the shuffle raging over receding agricultural prices and decreasing funds for fertilizers has been the recent surge of farmer-interest in cooperatives. But the trend's there for anyone to see. Evidence: some of the biggest expansion plans, now on tap for the fertilizer industry, will be those of the farm cooperatives; and if the movement continues to grow, the stage may be set for a top-to-bottom shake-up in industry-customer relationships.

At last count (in the 1951-52 season) there were some 10,143 farm co-ops operating in the U.S. doing an annual business of over \$9.4 billion. Today, ventures one observer, the number's probably increased by 10%—but there's no close comparison to the effect the farm co-ops are having on the sales of conventional fertilizer companies.

And adding to the private corporation's bundle of woes: Secretary of Agriculture Benson (who was once trustee and chairman of the American Institute of Cooperatives) has set a firmly favorable attitude toward co-ops in Washington. And the House Ways & Means Committee, led by Chairman Dan Reed (R., N.Y.) voted 13-10 against levying tougher taxes on co-ops this year.*

Sound Reasons: No one can seriously question the reasons behind the recent rapid growth of farm cooperatives, however. Agricultural conditions, are now back on an economic footing similar in many respects to

that of 1949. The Korean-induced inflation-deflation curve has come full circle; prices on almost all agricultural products have receded to pre-Korean levels; exports, swollen by war and reconstruction demands, have dropped off sharply.

"It's no wonder," admits one fertilizer executive, "that many small farm units, operated by individual families, financed largely from their own resources, are banding together in a desire to survive." And it's equally understandable, that many, finding the going rough on the farm front, are looking to production of farm supplies to augment diminishing incomes.

"You've got to get big if you want to survive today," notes Marvin Briggs, general manager of the Indiana Farm Bureau Cooperative Assn. "As farm prices have declined," says O. E. Zacharias, Jr., general manager of the Southern State Cooperative, "membership in our cooperative has picked up immeasurably." The co-op boasts 147 agencies, operating in 109 of Kentucky's 120 counties, has over 58,000 members. Evidence of the enthusiasm with which the farmers plug their own organization is seen at every company affair. When Southern State christened its new 35,000-ton fertilizer plant in Louisville, for example, over 900 member-owners turned up, cheered the joint effort. "It probably would be difficult to corral that many farmers and their families for anything else in Kentucky short of the Derby itself," admits one company executive. "The psychological value of feeling a part of the team is something the private com-

panies are going to have to go a long way to beat."

Other observers, in various sections of the country, are taking note of the same phenomenon. Best example in recent weeks was the fanfare accompanying the Cooperative Farms Chemicals Assn.'s shakedown run of a \$15-million plant at Lawrence, Kan. Due for fuel-blast production early this month, the new facilities will turn out 330 tons of ammonium nitrate and 180 tons of anhydrous ammonia daily.

The breadth of the interest in the project is tremendous. Both Consumers Cooperative Assn. (fourth largest farm supply purchasing co-op in the U.S.) and the Central Farmers Fertilizer Co., Chicago (which owns a \$2-million interest in the project and supplies 15 regional cooperative farm groups with fertilizer) are plainly jubilant. Central executives are now "assured of a steady supply of fertilizers;" and Consumers' management is "confident of enough outlets to keep the Lawrence plant running close to capacity."

Not content with simply expanding into fertilizer production Consumers Cooperative also has an oil refinery project working—already said to be producing daily over 6,000 bbls. of oil.* "No co-op hopes to supply all the farmer's petroleum needs," says assistant general manager Bruce McCully. "But when we have petroleum, refining and distribution facilities, it means the majors can't kick us around so easily."

Ripe with expansion plans, also, is Mississippi Chemical Corp.—one of the country's first farm-owned nitrogen producers. First phase in its over-all program was completed last February when 60 additional tons/day of ammonia capacity came onstream. But construction's also under way on a 120-ton addition to the co-op's nitric acid units, and a project due to bring MCC's ammonium nitrate prilling capacity up to 500 tons of ammonium nitrate per day.

In the face of such activity there's small wonder that privately owned chemical companies are seriously considering the effect that the rise of the farm co-op movement will have on business in the years ahead. Some are sure to be plugging for a discontinuance of federal aid when the question comes up again next January. Others will be looking for diversification ideas—on the theory that to "keep one step ahead of the co-ops is the only way to handle the situation."

On the federal aid theme, they may have no serious trouble, since more

* Some critics, for example, Rep. Noah Mason (R., Ill.), maintain that co-ops hold an \$800 million/year tax advantage over private business.

* Consumers Cooperative is just one of six U.S. cooperatives that within the past year have opened new catalytic cracking refineries.

than one major cooperative has already come out in favor of getting out from under the government's wing.

But as far as "keeping one step ahead" is concerned, they may be in for some rugged competition. Flush with success, the nation's farmers seem ready to go all out to "get a finger in the high-profits market."

COMPANIES

Basic Chemicals Co., Sausalito, Calif., has formed a new company, The Chemical and Pigments Co., at Oakland. Facilities, for the nonce, will include units formerly owned and operated by the chemicals-pigments-metals division of the Glidden Co. at Oakland plus mining properties in Tonopah, Nev. The new company will also serve as Glidden's sales agent on the West Coast for cuprous oxide, copper powders, colors.

American Potash and Chemical Corp. is making a strong bid for control of Western Electrochemical Co. by means of a change of stock. American Potash would be willing to exchange 75,000 shares of its Class B stock for all of the outstanding shares of Western Electrochem—contingent on the acceptance of the proposal by 51% of Western's stockholders.

The Foreign Operations Administration in Washington has agreed to guarantee a \$465,000 investment in La Societe Houilleres-Pechiney-Progil by the Koppers Co., Pittsburgh. Under terms of the guarantee, FOA will pay Koppers its investment if the U.S. company is unable to collect from the French concern because of currency exchange restrictions. FOA would take the French currency payments from Houilleres-Pechiney for use by the U.S. government.

Stockholders of Spencer Chemical Co. have been called to a special meeting on Sept. 24 to consider authorization of 250,000 shares of new preferred stock, \$100 par value. Part of the proceeds will be used to retire the 76,965 outstanding shares of 4.6% cumulative preferred stock now outstanding, the balance for general corporate business.

The Key Chemical Co., Washington, D.C., has bought an 8-acre industrial site in Medley (just north of Miami Springs) Fla., for \$25,000. No notice has yet been released when, and if, plant construction will start.

Chemical Enterprises, Inc., New York, has acquired nine companies special-

izing in the distribution of anhydrous ammonia and farm chemicals in the Northwest—Oregon, Washington and Idaho. The newly acquired companies will complement Chemical Enterprises' present subsidiaries in the region.

EXPANSION

Wood-Preserving: Federal Creosoting Co. will build a plant near Pittston, Pa., to treat timbers and railroad ties for use by highway, bridge and dock builders. Biggest consumers, company officials say, will probably be railroads in the immediate area—the Lehigh Valley, Delaware and Hudson, Erie, and Jersey Central.

Glass: Pittsburgh Plate Glass Co. will build a \$34-million glass plant at Cumberland, Md.—the largest expansion project in the company's 71-year history. Office of Defense Mobilization authorization has been granted covering rapid tax write-off on 85% of the cost of the plant; more than 600 acres of property have already been purchased as a plant site. Design work will be handled by Lockwood Greene

Engineers Inc., New York, and Pittsburgh Plate's engineering department.

Ammonium Nitrate: The CW item (CW, Aug. 21, p. 18) mentioned Friedrich Uhde, K. G., Germany, as designer of the ammonia oxidation unit for CFCA's \$15-million plant. However, The Girdler Co., Louisville, was over-all designer and constructor of the entire project.

Newsprint: Dierks Lumber and Coal Co., Little Rock, Ark., is said to be studying the possibility of building a plant in South Arkansas (at a cost of \$20 million) to produce newsprint and various chemical compounds. Choice of a plant site awaits completion of studies on the availability of water, shipping facilities, natural gas and various raw materials.

Asphalt: American Bitumuls & Asphalt Co. has opened its \$4-million asphalt plant at Cincinnati, O. Situated on a 100-acre site on the Ohio River, the plant has a storage capacity of 45 million gal., one of the largest facilities of its type in the area.



Objective: Fun and Frolic

TAKING BOWS this week with Brazoria County's Chamber of Commerce, which sponsored a development that opens miles of recreational beach area to dust-ridden Texans, is Dow Chemical's Freeport Division. Prior to the opening of the 2,416-ft. Surfside Bridge (see cut), pleasure-seekers were forced

to use a pontoon-type bridge to cross over the Intracoastal Canal for ocean bathing; often barges, passing through from Florida to Mexico made the beach inaccessible. Dow's contribution (\$100,000) will be earmarked for erecting public facilities, such as parking strips, picnic areas.

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*The Journal of Pharmacology and Experimental Therapeutics—Vol. 104, No. 2, Feb. 1952.

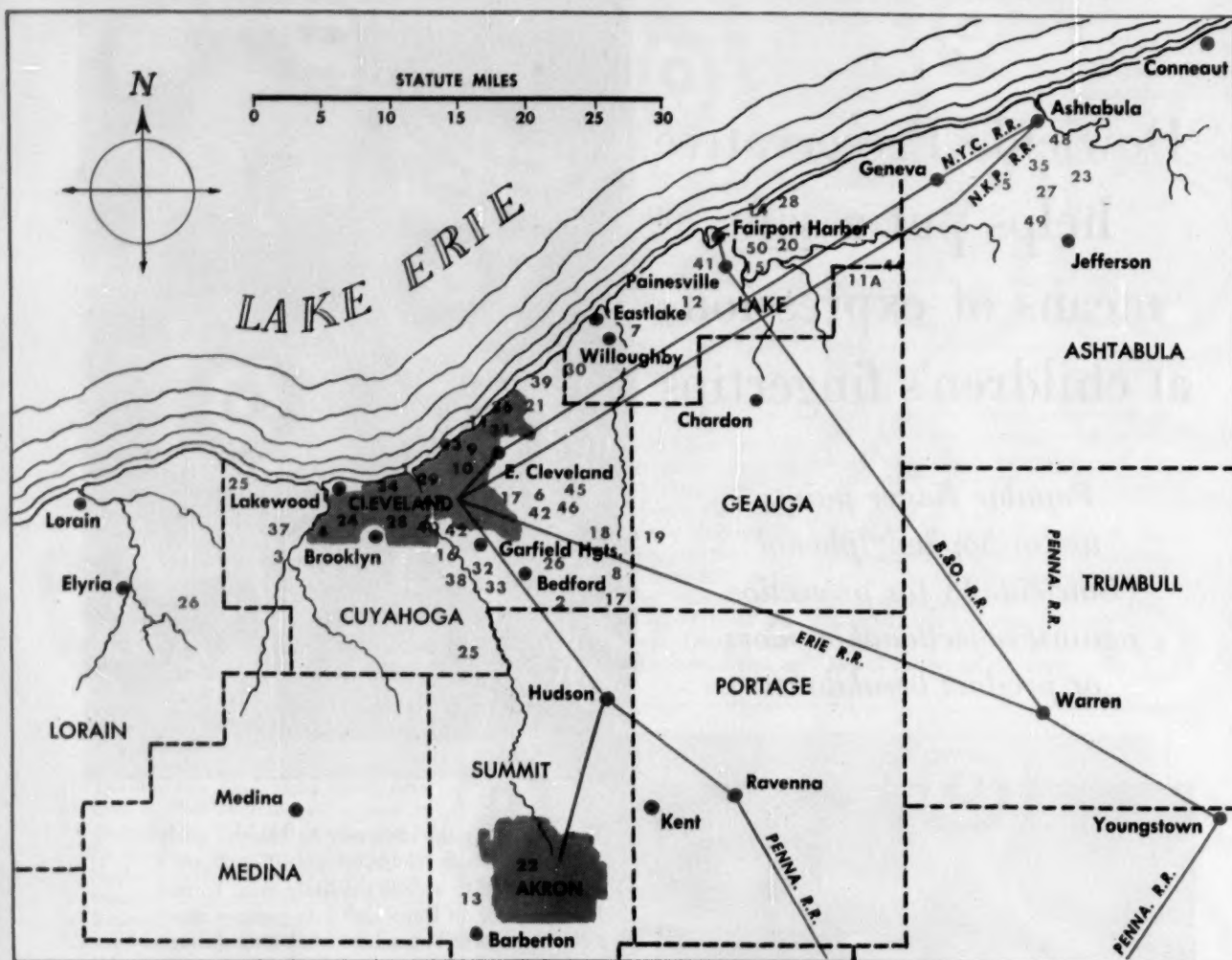
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Choicest Customers, Nearest Neighbors

It's not because of better mousetrap manufacturing, particularly, but the world is about to beat a big new pathway to Cleveland's door—and this is bringing no end of delight to the chemical process companies that are clustered in and around that lakeside city.

Already, Great Lakes shipping has helped build up a northeast Ohio chemical industry employing close to 20,000 persons along a 100-mile stretch on Lake Erie (see map and key, above). This convenient waterway not only brings in the chemical raw materials—dolomite, limestone, sulfur—but also has served to set up close-at-hand, big-time customers for the chemicals produced here: oil refineries, rubber companies, steel mills, glass factories, soap and deter-

gent makers, plastic fabricators, and suppliers of agricultural chemicals.

That these industries have been good, steady customers is attested to by the fact that chemical producers in the Cleveland area have spent more than \$200 million on new plants and equipment since the end of World War II; and another \$65 million is being invested in this year's expansion projects. Among the latest to be announced: Barium & Chemicals, Inc., new research laboratory and additional production facilities, \$3.6 million; Stauffer Chemical, increased production capacity so that perchloromethyl mercaptan can be offered in commercial quantities; U.S. Rubber's Naugatuck Chemical Div., doubling of production capacity for Marvinol vinyl resins.

And Next the Seaway: Now, on top of all this, appraisals of northeast Ohio industrial activity must take into account the St. Lawrence Seaway, to be built jointly by the U.S. and Canada, which in effect will make Cleveland an ocean shipping terminal by 1960 (*CW*, May 22, p. 74). Costs of hauling in raw materials and of distributing finished products will plummet. Already strategically located between this country's two biggest market areas (New York and Chicago), Cleveland is about to become a seaport with low-cost shipping routes to everywhere.

One direct effect of the Seaway, of course, will be to bolster the position of the oil, rubber and metal industries that buy much of the area's chemical output. This will mean a general

KEY NO.	COMPANY	PRODUCTS	KEY NO.	COMPANY	PRODUCTS
1	Acorn Refining Co.	Paints	25	B. F. Goodrich Co.	Vinyl chloride, plasticizers
2	Allied Chemical & Dye Corp., General Chemical Div.	Sulfuric acid	26	Harshaw Chemical Co.	Fluorides, nickel salts, ceramic colors and finishes
3	American Agricultural Chemical Co.	Sulfuric acid	27	Hooker Detrex Chemical Co.	Perchloroethylene, trichloroethylene
4	American Marietta Co.	Paints	28	Industrial Rayon Corp.	Viscose rayon
5	Archer-Daniels Midland Co.	Linseed oil	29	Interchemical Corp.	Printing ink
6	Arco Co.	Automotive lacquers, enamels	30	Lubrizol Corp.	Lubricant additives
7	Barium and Chemicals, Inc.	Barium compounds	31	Masterole Co.	Pharmaceuticals
8	Ben Venue Laboratories, Inc.	Pharmaceuticals	32	McGean Chemical Co.	Nickel salts
9	Braden Sutphin, Inc.	Printing ink	33	Benjamin Moore & Co.	Paints
10	Brush Beryllium Co.	Beryllium compounds	34	National Carbon Co.	Electrodes, graphite equipment, batteries
11	Burdett Oxygen Co.	Gases	35	National Distillers Products Corp.	Sodium, sodium peroxide, chlorine
11A	Calhio Chemicals, Inc.	Insecticides	36	Patterson Sargent Co.	Paints
12	Clifton Products	Beryllium compounds	37	Pittsburgh Plate Glass Co.	Paints
13	Columbia-Southern Chemical Corp. (Subsidiary of Pittsburgh Plate Glass Corporation)	Caustic soda, chlorine	38	Reilly Tar & Chemical Co.	Coal tar derivatives
14	Diamond Alkali Co.	Caustic soda, chromates, chlorine	39	Sheffield Bronze Paint Corp.	Paints
15	Diamond Magnesium Co.	Metallic magnesium	40	Sherwin Williams Co. (4 plants)	Paints, varnishes, lacquers
16	E. I. du Pont de Nemours & Co., Grasselli Chemicals Dept.	Acids, agricultural chemicals, silicates, zinc salts	41	A. E. Staley Mfg. Co.	Soya bean oils
17	Ferro Corp.	Pigments, glazes, chemicals	42	Standard Oil Co.	Refinery products
18	Garland Co.	Waterproofing, coatings	43	State Chemical Mfg. Co.	Waxes, supplies
19	General Biochemicals, Inc.	Pharmaceuticals	44	Stauffer Chemical Co.	Carbon bisulfide
20	General Chemical Co.	Sulfuric acid	45	Strong Cobb & Co.	Pharmaceuticals, vitamins
21	General Electric Co., Chemical Products Div.	Krypton, neon, oxygen	46	Tremco Manufacturing Co.	Paints, maintenance supplies
22	General Foods Corp., Colonial Salt Div.	Salt	47	Tropical Paint & Oil Co.	Paints, roofing specialties
23	General Tire & Rubber Co.	Polyvinyl chloride	48	Union Carbide and Carbon Corp., Electro Metallurgical Co. and Linde Air Products Div.	Ferro alloys, calcium carbide, oxygen, argon
24	Glidden Co.	Paints, varnish, naval stores	49	U. S. Government Carbide Plant (G. S. A.)	Not in use
			50	U. S. Rubber Co., Naugatuck Chemical Div.	Vinyl chloride, resins

burgeoning of the region's manufacturing and commercial economy. Charles Ewald, executive director of the Cleveland World Trade Assn., predicts that with favorable legislation and an aggressive sales program, the Seaway will bring the city at least \$1 billion worth of foreign trade annually.

The Seaway also is expected to sow new seeds in the area's chemical garden. Foreign ores that are now transhipped can be carried right up to the plant site by ocean-going freighters. Among the types of chemical process plants that might then flourish at Cleveland: phosphorous chemicals, abrasives from bauxite, and electro-metals—especially chromium, manganese and titanium.

New Glamour Metal: Right now, titanium is the big eye-catcher of those prospective newcomers. Negotiations are nearly complete between the U.S.

government and Union Carbide and Carbons' Electro Metallurgical Co., which plans to build a \$30-million plant on a 100-acre site near Ashtabula to turn out titanium sponge metal at the rate of 10,000 tons/year.

Kennecott Copper Corp. also is known to be interested in the area as the location for a proposed titanium plant. The Seaway looms large in this scheme; it would enable Kennecott to ship in titanium slag from the plant it operates with New Jersey Zinc at Sorel, Quebec.

When these titanium plans are set, the area's chemical industry is in for another round of expansion. Though details of the Electro Met process haven't been published, it's believed to require large quantities of sodium and chlorine. National Distillers Products Corp.'s chlorine-metallic sodium plant at Ashtabula and Diamond Alkali's caustic-chlorine

operation at Painesville are understood to be ready and willing to expand present facilities to meet the needs of Electro Met and any other future titanium producers.

Short Sales Trips: Selling chemicals to your next-door neighbor is the cornerstone of the chemical process industries in northeast Ohio. Around Ashtabula and Painesville, there's a chemical complex that presents one of the world's best examples of multi-company integrated operations. A growing list of products such as hydrogen chloride, hydrogen, chlorine and acetylene are being intershuttled in this area by pipeline.

Diamond Alkali, for instance, sells caustic soda and chlorine to Calhio Chemicals, which produces fungicides for the agricultural outlets. Stauffer Chemical delivers carbon bisulfide to Industrial Rayon Corp., which turns out rayon cord for the tire manu-



ABOVE, HARSHAW'S CLEVELAND PLANT: From East 97th Street, colors, pigments, and chemicals.

BERMAN



AT RIGHT, DU PONT'S SULFURIC PLANT: For nearly 90 years, supplying acid to oil, steel firms.

BERMAN

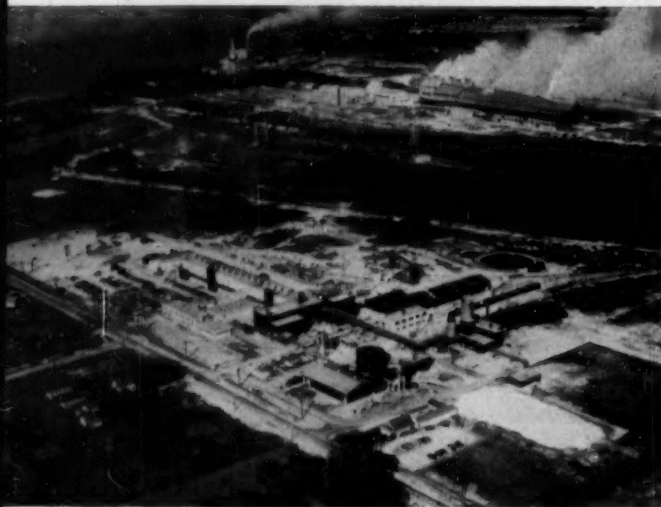


ROBERT L. PLANTS

ASHTABULA'S HARBOR: Planned for this future seaport, big titanium shipments.

facturers at nearby Akron. National Distillers sends metallic sodium to Archer-Daniels-Midland, which uses it in making fatty alcohols for detergent makers.

There are still more links in this chain. With calcium carbide from Electro Met and hydrogen chloride from Diamond Alkali, Naugatuck Chemical produces polyvinyl chloride for plastic fabricators. Another supplier of that same material is General Tire's chemical plant, which gets its hydrogen chloride from Hooker-Detrex and its acetylene from Linde. In turn, Hooker-Detrex gets its chlorine from National Distillers and Linde uses calcium carbide from Electro Met in making acetylene. Linde also pipes acetylene to Hooker-Detrex which uses it to produce degreasing



AERIAL SURVEYS, INC.

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B & I

agents for metalworking industries. Oil refineries in the area get sulfuric acid from General Chemical and Grasselli Chemical plants.

Founded on Refining: It was this kind of an on-the-spot industrial market that brought the first important chemical plant to this area. That was back during the War Between the States, when John D. Rockefeller, Sr., began to refine petroleum at Cleveland—the birthplace of Standard Oil Co. In 1865, Eugene Grasselli started a sulfuric acid plant to supply the oil and steel companies in Ohio; his firm became a part of the Du Pont organization in 1928.

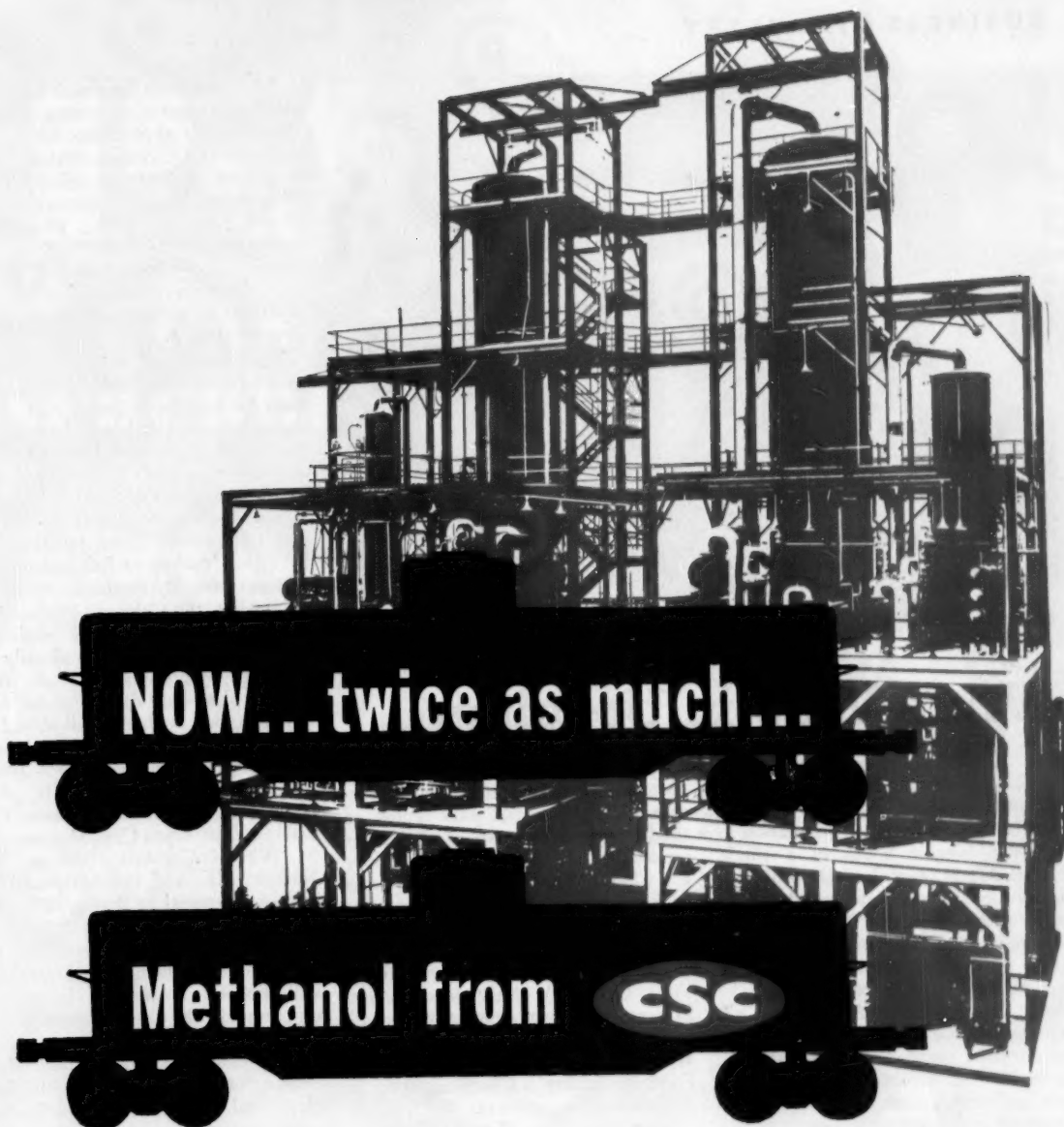
Pioneers in the movement that has made Cleveland a leading center of paint and varnish manufacture were Sherwin-Williams (1870) and the Glidden Co. (1875). Harshaw Chemical began production just before the turn of the century; and there are now more than 50 makers of coatings, pigments and related products in Cuyahoga County including Ferro Corp.,—a major producer of porcelain enamel frits.

Outside the city, the Painesville-Ashtabula vicinity was opened to the chemical industries by Diamond Alkali, which started producing soda ash for glass makers in 1912. That plant has been expanded manifold since then, now produces caustic soda, chlorine, sodium bicarbonate, muriatic acid, chromates, coke by-products, and alkali specialties.

Rhyming Slogan: Biggest booster for this region is Cleveland Electric Illuminating Co., which for the past nine years has been plugging its "Best location in the nation" theme—with heavy emphasis on chemicals.

As to power supply, CEI has been expanding so that its present generating capacity—more than 1.5 million kw.—is nearly double the 1949 figure. Lake Erie constitutes a vast fresh water supply—of prime importance to chemical producers. Natural gas rates are higher than in Texas chemical centers, of course; but the Ohio Fuel Gas Co.—affiliated with the \$600-million Columbia Gas System—appears to be in a position to furnish whatever quantities may be called for.

Formerly, CEI's "best location" slogan was based mostly on the fact that within 500 miles of Cleveland are 75% of U. S. industrial capacity and 57% of the population. Now that the slogan is taking on added meaning because of the Seaway, the Cleveland area seems destined to exert still greater drawing power in the competition to attract new chemical plants.



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Bulk distribution has been expanded to give fast delivery to the Midwest and eastern seaboard. Tank and barge service points have been enlarged and increased in number. Bulk terminal facilities are now maintained at Carteret, N. J., Camden, N. J., New Haven, Conn., New Orleans, La., Chicago, Ill.

.....
COMMERCIAL SOLVENTS

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ORE PROCESSING: In midst of Plateau uranium bustle, USV's big mill at Uravan.

Who's Who in Uranium

For the U.S. chemical industry, uranium processing is fast becoming a big and important business. Not only has the current frenzied speculation in uranium—biggest boom in a single commodity in years—brought prospecting to an all-time high, but the AEC reports this week that U.S. output of uranium ore and uranium concentrates in the first six months of 1954 has also achieved a record.

Aside from military importance, all this activity in uranium is significant to chemical companies. On the Colorado Plateau, mining and processing ore has become close to a \$100-million business and is growing. Ore mills require sizable quantities of salt, soda ash, sulfuric acid and anhydrous ammonia. Each year, for example, the industry on the Colorado Plateau takes more than 25,000 tons of sulfuric acid alone.

Not Just a Batboy: But the role that the chemical industry is playing in uranium processing is not simply that of supplying its needs. Almost every month, new companies nudge into the uranium picture; other companies—who've been "in" since the start—draft fresh expansion plans. There are plenty of examples.

United States Vanadium, a division of Union Carbide, pioneered mining and production on the Plateau. Its mill at Rifle, Colo., one of the first in the area, is still operating, and USV runs another mill at Uravan, Colo. Another pioneer, Vanadium Corp. of America,

operates the fabulous Monument II (Monument Valley, Ariz.) and Marysvale (Utah) mines, plus scores of smaller mines and two of the major processing plants. Anaconda Copper and Climax Molybdenum (which owns 84% of Climax Uranium) are also mining and processing ore on the Colorado Plateau. National Lead, Vitro Corp. of America (through its subsidiary Vitro Uranium), New Jersey Zinc, Kennecott Copper, among others, all have uranium interests. Through its Westvaco Mineral Products Division, Food Machinery & Chemical Corp. is prospecting for uranium.

More Processing Plants: Others are edging in on the processing end. Kerr-McGee Oil Industries, Inc., for instance, will complete its new mill at Shiprock, N.M., this year. Anaconda Copper is building a mill at Grants, N.M., has also completed expansion of its Bluewater, N.M., plant. Vitro Uranium will add roasters to increase by 50% the capacity of its Salt Lake City mill. Vanadium Corp. of America and Climax Uranium are likewise considering expansions, and the AEC plans to expand its Monticello, Utah, mill.

Adding to its chain of ore-buying stations, AEC has opened a new one at Moab, Utah, and will open another at Hite, Utah. Both will be operated by American Smelting & Refining, which already operates ore-buying stations at Monticello, Marysvale, Shiprock, and at Edgemont, S.D.

AEC continues its research for new and better ways of recovering uranium. Development of processes for the new mills on the Colorado Plateau is an important part of this effort. In the Winchester, Mass., laboratory and the Grand Junction, Colo., pilot plant, both now operated for AEC by National Lead—which has taken over from American Cyanamid—lower cost processes of getting uranium from its ores are sought.

The Bureau of Mines cooperated with Kerr-McGee in developing processes for its new Shiprock mill. Additional test work is being done by the Bureau of Mines and Dow Chemical at the bureau's Salt Lake City station, by the Galigher Co. at Monticello, by Anaconda Copper at Grants, by Climax Uranium at Grand Junction, and by Vitro Uranium at Salt Lake City.

Recovering By-Products: While it's the busiest, the Colorado Plateau isn't the only place in the U.S. producing uranium. Four plants are already recovering by-product uranium from Florida phosphate rock, and the AEC is negotiating with several phosphate firms for construction of additional plants. First in production was Blockson Chemical at its Joliet, Ill., phosphate plant. Next came Texas City Chemicals at Texas City. More recently, Virginia-Carolina Chemical at Nichols, Fla., and International Minerals & Chemical at Bartow, Fla., began production.

At its \$5-million South Point, O., plant, Allied Chemical & Dye Corp. will pioneer recovery of by-product uranium via the manufacture of fertilizer by nitric acidulation.

AEC is also exploring methods of extracting uranium, together with phosphate and alumina, from the leached zone material overlying the commercial phosphate rock deposits of Florida. International Minerals and TVA have been piloting this process, which, according to AEC, "shows promise." Others interested: Aluminum Co. of America, General Chemical, Virginia-Carolina, Texas City Chemicals and Blaw-Knox.

Getting uranium concentrates (from whatever source—domestic or foreign) is only part of the vast undertaking required to keep the nation's atomic plants going, however. Impurities in the concentrates must be removed, and the purified compounds processed into uranium metal for plutonium production, or into uranium hexafluoride to be fed to gaseous diffusion plants. Mallinckrodt, Harshaw, Vitro and National Lead all are active in this field.

It totals up as a major interest to all sectors of the chemical industry.

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BOX SCORE ON TARIFFS

WHAT'S BEEN DONE

Tariff Increases:

Eisenhower approved duty increases of up to 50% on most imported watches.

Reciprocal Trade:

Congress ducked the President's proposals for overhauling the foreign trade structure, voted a simple one-year extension of current trade law.

Export-Import Bank:

Legislation passed this summer re-establishes the bank's board of directors and expands its lending authority to \$5-billion.

Lead-Zinc:

Tariff Commission has recommended escape clause relief for lead and zinc industries. President last week decided an alternate route.

WHAT'S GOING ON NOW

High Tariffs:

Senate Finance Committee has asked Tariff Commission to hold omnibus hearings on 440 items with tariffs 50% or higher. Hearings are completed; report is due Dec. 1.

GATT:

Big item of full membership for Japan will be the subject of November meeting of General Agreement on Tariffs and Trade. Passage could mean rash of multilateral trade agreements between Japan and U. S.

Customs Simplification:

Bill, as finally passed, asks Tariff Commission to review entire U. S. customs picture, make recommendations for overhaul by August 1956.

Convertibility:

Big subject of a series of international meetings scheduled for this fall . . . could be a big item in general trade picture.

HELD OFF UNTIL 1955

Kean Bill:

Legislation embodies the recommendations of the Randall Commission and Eisenhower on long-term tariff policy. It's now scheduled for consideration and hearings early next session.

Hardboard Tariff:

Congress tried to do some tariff-setting itself on hardboard; the House even passed H.R. 9666, boosting hardboard tariffs. But Senate Finance Committee has asked Tariff Commission to study the situation, report on its findings early next year.

Calling a Draw on Tariffs

U.S. foreign trade policy—should we have more or less tariff protection for home industry?—was supposed to be settled this year, but instead has come through this session of Congress almost unchanged. Result: the trade and tariff fight (in which the chemical industry has a vital interest) will crop up again next spring—with all its explosive problems.

In effect, President Eisenhower tried to do something about tariffs this year, sent a flock of suggestions to Congress—most of them taken verbatim from the Randall Report on trade policy. Congress ducked the issue however (see chart), and fell back on a simple one-year extension of the present reciprocal trade act.

Beyond extending reciprocal trade, new tariff legislation chalked up by the 83rd Congress was scanty indeed. The activities of the Export-Import bank (previously curbed by the Administration) were expanded; Export-Import got back its board of directors and had its lending authority hiked from \$4.5 to \$5 billion.

Held in Abeyance: Beyond that, it's been largely a record of "holding the line" on tariffs this year:

- Three items were passed on to

the Tariff Commission for study, will be coming up for consideration when the commission reports next February.

- The Customs Simplification bill, which turned out to be a political hot potato, was finally passed—but in a strictly noncontroversial form. Its most stringent requirement: that the Tariff Commission study the whole customs system with the object of making recommendations for an overhaul two years from this month.

- The Tariff Commission has also been charged with the task of making a survey of all tariffs presently running 50% and over, will report its returns by Dec. 1 for use in the big tariff shakedown scheduled for the spring.

Worldwide Implications: The Eisenhower Administration may yet have a chance to get in its inning on tariff policies this year, however. There are a series of international meetings scheduled this fall that may have a heavy impact on world trade. At the first—the International Monetary Fund annual meeting in September—U.S. policy on convertibility could have a strong bearing on future world trade potential. Eisenhower representatives at the Inter-American economic con-

ference in Rio (scheduled for November) are sure to take a stand on Western Hemisphere trade, and at the important GATT meeting (also in November), admittance of Japan as a full-fledged member would necessitate a round of multilateral trade agreements aimed at easing barriers against importation of merchandise made in Japan.

For chemical companies, however, there's very little immediate prospect of doing anything until Congressional hearings start up again in January. Many report they're pleased with the current status quo on tariffs; others are outspoken in their demand for immediate change.

A few—noting the President's approval of tariff increases on watches gained after a series of denials on such items as briar pipes and fish fillets—expect the move to jog loose a batch of applications for escape clause relief. Denial of such relief to lead and zinc producers last week dulled but didn't erase their expectations.

Whatever the immediate outlook, however, there's one firm prospect in view. Having ducked and weaved on tariffs this session, Congress won't be able to dodge much longer. By spring, the pressure will be on for action—for across-the-board revision of present tariff laws.

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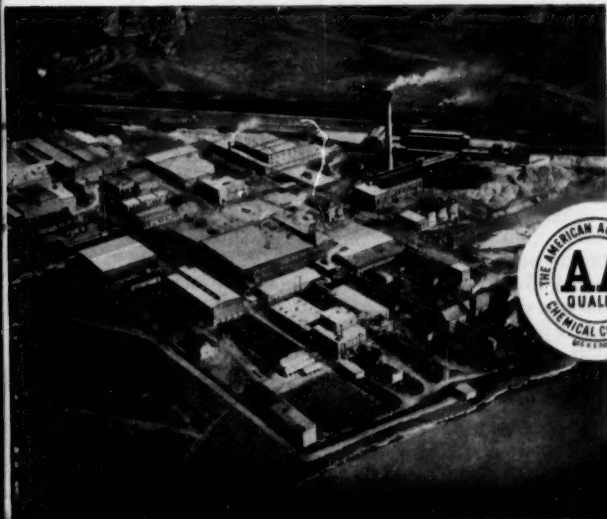
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Here's What Security Analysts Want to Know

- ✓ What's the significance of present research?
- ✓ How's the company's competitive position and product diversification?
- ✓ Does the company have ready sources of raw materials? Future availability?
- ✓ Major markets? Basic manufacturing processes? Trends?
- ✓ Management potential? Experience? Foresight?

Untying the Purse Strings

Today, in an era that demands particular attention to relations with stockholders and the investing public, one of the most challenging tasks confronting chemical executives is putting a company's story across effectively to the nation's 4,000 security analysts. How well it's done can shave hundreds of thousands of dollars from financing costs.

Nonetheless, many top management men admit they know little about the type of information security analysts really want. Often, when faced with the problem of presenting their company's profile, they're shooting in the dark, "hoping to find the kind of approach that will appeal." To "sell" their company, some try plant tours; others enlist the support of the entire management staff for a round-table discussion of the firm's activities.

Some succeed; others fail. But all wish they'd known more about just what security analysts want to hear before they had started out.

Essential Wants: Polling security analysts last week, CW found these likes and dislikes, do's and don't's. Here's what they want to know, and what they care least about:

Surprisingly, it's not financial information (to which they have access anyway) but rather a broader understanding of the business itself in terms of products, processes, markets, management and research, that analysts say they need most.

Essentially, they want to know what makes a company tick. They don't want information from annual reports or statistical manuals. Instead, they seek the human story behind these in-

ert figures. And they want a base on which they can make some intelligent assumptions about the future.

They seek orientation. They want to know briefly about the industry as a whole, and they're after a capsuled discussion of the company and its outlook. They're eager to learn about new things that are coming and what parts of the company are likely to furnish most of the new blood to future earnings.

"I want the top management men to help me project my views of what they are going to do," says one analyst. "I want to be able to predict their rate of growth, whether it will double or quadruple. I want a sense of the direction the company is taking. I want to know where the top executive and his team intend to go in the next 10 years."

Research, new processes and new products intrigue the securities experts. They want estimates of cost savings from new or improved processes and some idea of how much they will widen profit margins. They want the sales prospects for new products—with figures. (It's a good idea to translate as much as possible into terms of money.) Above all, they want to know what is going to happen and where the company is headed.

Break Down Sales: "Give us a sales breakdown by major products," pleads one analyst who specializes in chemicals. "I want to know how much different divisions are contributing to net income," declares another, "and I like to get the sales and profit margins of the different divisions."

On new products, the analysts stress the importance of telling exactly what

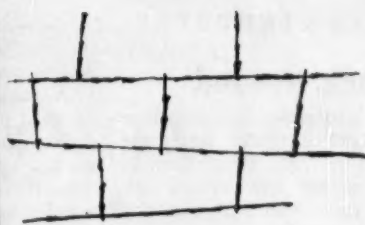
a product can be used for, and how its manufacture will tie in with present production processes. "Emphasize the outstanding advantages of any new product. But be sure to mention limitations. (This builds confidence.) The same goes for the whole presentation. Don't shy away from the soft spots."

The securities experts are eager to learn how much is spent on research and development in the aggregate, as a percent of sales and as a percent of net income before federal taxes. (This enables them to correlate money spent on research with sales and profits.) They like to see how a research budget relates to the size of the enterprise.

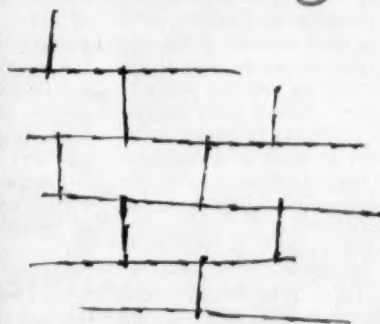
Watch Timing: The timing of an appearance before the security analysts is, however, a sensitive factor. The worst time is just before a financing. Analysts decry such "pressure tactics."

In addition to the president or chairman of the board, it's a good idea to have at least three or four others of the top management team on hand. The man who heads manufacturing, the chief financial officer and the research director are all candidates. Having their specialized knowledge on tap helps, but also analysts like to get acquainted personally with these key men. Knowing them is an intangible but decisive element in appraising any company's future.

Most chemical executives who confront them, security analysts say, realize the value of a candid approach. The managements of even the most conservative chemical companies are aware today of how important it is to keep the financial community factually well informed. And they're brushing up their presentation techniques to convert apathetic analysts to zealous supporters.



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New Tack Needed

Confirming a suspicion that has been bruited in chemical circles during the past several months, West German manufacturers are now openly admitting that trade with Latin America has reached a plateau. Latest figures show that exports for the first five months of 1954 are just about holding their own with 1953's export record; and the recent visit of Economics Minister Erhard has had little, if any, stimulating effect on business contracts.

The reason, observers point out, is starkly simple. Despite all the attempts by leading German industrialists to generate goodwill in South America, the chief obstacle in the way of trade expansion is the Latin American countries' current debts to West Germany. Almost every country has by now exceeded its "swing limit" (set up under its trade and payments agreement with Germany), and the German government is loth to extend the limits any further.

Argentina is a case in point. As of today, its "swing debt" amounts to about \$30 million. It has been decided (in Bonn) that Argentina will repay its debt beginning in 1955 at an annual rate of \$10 million; but to date neither method of payment nor interest rate has been determined.

Few Other Possibilities: Major German chemical manufacturers, of course, have several ways to beat the system. Self-financing (exemplified by the recent deal signed by the Chilean company CORFO and two West German companies to build a new cellulose plant in Chile) is possible when the German company can command adequate funds for investment purposes. Private bank loans (though expensive) can be used to a limited degree to finance exports; and a few chemical companies in Germany have manipulated semi-official government financing (through the *Ausfuhr-Kredit A.G.*—a consortium of private banks) to enable themselves to extend exports.

But the rank and file of German chemical makers have reached the peak of export possibilities to South America under the present setup. Unless the system is changed radically in the next few months, they'll have to search elsewhere for additional markets for their goods.

Peakless Mountain?

Even the highest Himalayas have now been surmounted; but as of this week, there's still no summit in sight for chemical and other industrial wage rates, which have been ascending more

or less steadily for the past 15 years.

At some 17 chemical and pharmaceutical plants, recent wage increases have pushed individual earnings up by an average of more than \$100/year. That this additional labor cost mounts rapidly in the case of large chemical firms is seen in Dow Chemical Co.'s annual report to employees: while number of employees rose by less than half of 1% during the past year, money paid out in wages at all Dow plants was up by 10%.

For the industry as a whole, total wages to hourly paid employees appear to be at about the same level as last year, despite incessant rounds of rate rises. This is largely because of greater plant productivity achievements plus economic factors that have led to reduction of plant forces. Thus a 3.4% increase in individuals' average weekly earnings has been offset by a 3.6% drop in the number of production and maintenance workers.

Fringe Benefits up: Meanwhile, there's an even steeper climb in cost of pensions, vacations, hospital insurance, and all the other "extras" that are being included in current chemical labor contracts. Dow doesn't specify the percentage increase in this cate-

gory, but notes that group insurance benefits were scaled upward, the company paid out nearly \$2.6 million in claims under the group insurance program, and pension and profit-sharing programs were continued.

For 940 companies surveyed by the U.S. Chamber of Commerce, fringe benefit costs during 1953 averaged \$720 per employee—an increase of \$76 over the 1952 figure. The chamber's final report on this survey—out last week—showed that average cost of fringe benefits to those companies was 34.6¢ per man-hour worked, or 19.2% of total payroll.

Most popular wage rate increase among the new chemical contracts is 5¢/hour, the amount specified in eight of the 17 agreements. Most other pay hikes are close to that figure. Three wage boosts were put on a percentage basis: Kay-Fries Chemicals, Pearl River, N.Y., 5%; Stauffer Chemical, Tacoma, Wash., 4½%; and Du Pont, Seneca, Ill., 2½%. The \$9/month increase being made by Vanadium Corp. of America, Niagara Falls, N.Y., figures out close to 5¢/hour on a 40-hour basis. Other increases range from 3¢/hour to a spread of 7 to 15¢/hour.



Destination: Decca, Pakistan

WHEN FLOOD WATERS knocked out municipal water supplies in East Pakistan last month, Army Globemasters were made available to Mathieson Chemical Corp. and Chemical Supply Corp. to rush 200 drums of HTH calcium hypochlor-

ite to the scene. Part of one of the biggest Red Cross flood-relief operations in history, the planes (seen here loading at Niagara Falls' Municipal Airport) were staffed by Army personnel from Donaldson Airbase, Greenville, N.C.

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AFL'S MEANY: In organized labor, a demand for political belligerence.

LABOR

Soapbox Speeches: You can expect a political theme to dominate your employees' Labor Day festivities this weekend if the workers are labor union members. Leaders of organized labor, expressing a growing irritation with economic and political developments since 1953, are calling on their followers for brusque political action this fall to reverse those trends. Typical of the exhortations going out to union members in chemical plants is AFL President George Meany's denunciation of the new tax bill as "an insult and an injury" to workers.

Shift to Prevention: Not only will the International Chemical Workers Union (AFL) have more organizing vitality under its new president, but it also will give better and more frequent "servicing" to its locals. This is the prediction of Sidney Garfield, the union's Chicago vice-president, who led the insurrection against the outgoing regime (CW, Aug. 28, p. 12). This should make chemical management happy, Garfield thinks, because the emphasis in staff members' activities will be shifted to preventive work—to work out disputes before strike pressure builds up.

Garfield's charge that ICWU hasn't been keeping up with the chemical industry in general growth seems to be substantiated by the figures in ICWU's annual report, just released by Secretary-Treasurer Marshall Shafer. While income from membership fees increased by \$167,000 from fiscal year 1951 to 1952, the increase

shrank to \$103,000 in 1953 and to \$82,000 this year. This item totaled \$1,092,013 this year—equivalent to a paid-up membership of 91,000.

Merger Moves Along: The plan to merge the two CIO unions that are most active in the chemical and petrochemical fields now is moving along toward the final stages. Rank-and-file delegates to the recent joint meeting in Washington agreed on a proposed constitution for the combined unions, and now it's up to the general membership of both unions. The United Gas, Coke & Chemical Workers will decide later this month in convention at St. Louis whether to accept the new constitution; and if Gas-Coke's answer is in the affirmative, then the Oil Workers International Union will register its verdict two months later.

Hemispheric Strike: Concerted action on the part of allegedly left-wing labor unions in both the U.S. and Chile has cut a big chunk out of copper production in the Western Hemisphere. In Montana, the International Union of Mine, Mill & Smelter Workers brought a shutdown to Anaconda's copper, zinc and manganese operations; in Chile, the strike was against Kennecott.

Separation Systems: When market conditions force a chemical company to halt or curtail one manufacturing activity in favor of other projects, there's always the problem of what to do about the employees affected.

American Viscose Corp. is paying out \$1 million to some 750 production and maintenance workers laid off at its rayon yarn plant at Marcus Hook, Pa. The separation plan has been accepted by Local 10, Textile Workers Union (CIO); persons leaving the company have a number of alternatives as to separation allowances and pension rights, based on length of service. They're still eligible for state unemployment compensation.

Du Pont, in preparing to end rayon production at Buffalo, N.Y., says that it has worked out plans to make the transition as easy as possible for the approximately 1,000 employees involved. More than 100 will be transferred to other Du Pont plants (including the company's film department facilities at the same site), and 135 who are now within five years of eligibility for retirement will be retired with full privileges and benefits. The other 823 employees will receive about \$2 million in termination allowances.



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6

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BUSINESS & INDUSTRY



SECRETARY HOBBY: In Food & Drug agency, no "leaks" on trade secrets.

LEGAL

Silence, Speed-up, Suspect: Statements of policy and plans of action came tumbling out of federal government agencies last week:

- A promise that drug manufacturers' trade secrets will be handled as confidential information comes from Secretary Oveta Culp Hobby, whose Dept. of Health, Education & Welfare includes the Food & Drug Administration.

- A speed-up in Federal Trade Commission proceedings is offered by FTC Chairman Edward Howrey. He told members of the American Bar Assn. at their convention in Chicago that FTC has eliminated about 50 procedural steps in what he terms "a full-fledged attack on delay." From now on, Howrey says, there'll be a greater effort to check allegedly unfair competition in its earliest stages.

- A matter of ethics is bothering Asst. Attorney General Stanley Barnes, who's in charge of the Justice Dept.'s Antitrust Division. The problem, which Barnes says has been turning up more frequently recently, is this: When a company lawyer suspects that the government is about to subpoena certain company records, is he justified in having those records destroyed before the subpoena is issued? Barnes thinks the practice is ethically wrong, even though it might not be punishable as contempt of court. Barnes—also speaking at the ABA meeting in Chicago—said that he came into office last year expecting to find "many" antitrust suits that should have been dismissed, but found only a few that seemed unjustified.

- The Treasury Dept.'s Bureau of Narcotics is about to determine whether 4,4-diphenyl 6-dimethylamino 3-hexanone should be classed as an addiction-forming drug like opium. Statements may be submitted up to Sept. 21, and an oral hearing will be held on that date if anyone asks for it by Sept. 8.

- **Not Enough Signers:** Opponents of water fluoridation in Chicago are now contemplating court action as a possible means of keeping the city government from carrying out that program. They failed in their bid to have the fluoridation question submitted to the citizens in a Nov. 2 referendum; their petition for that vote carried fewer than 25,000 signatures. Needed: 496,000.

- **Pollution Penalties:** Chemicals in Virginia streams have moved the state water control board to take action against two chemical process firms:

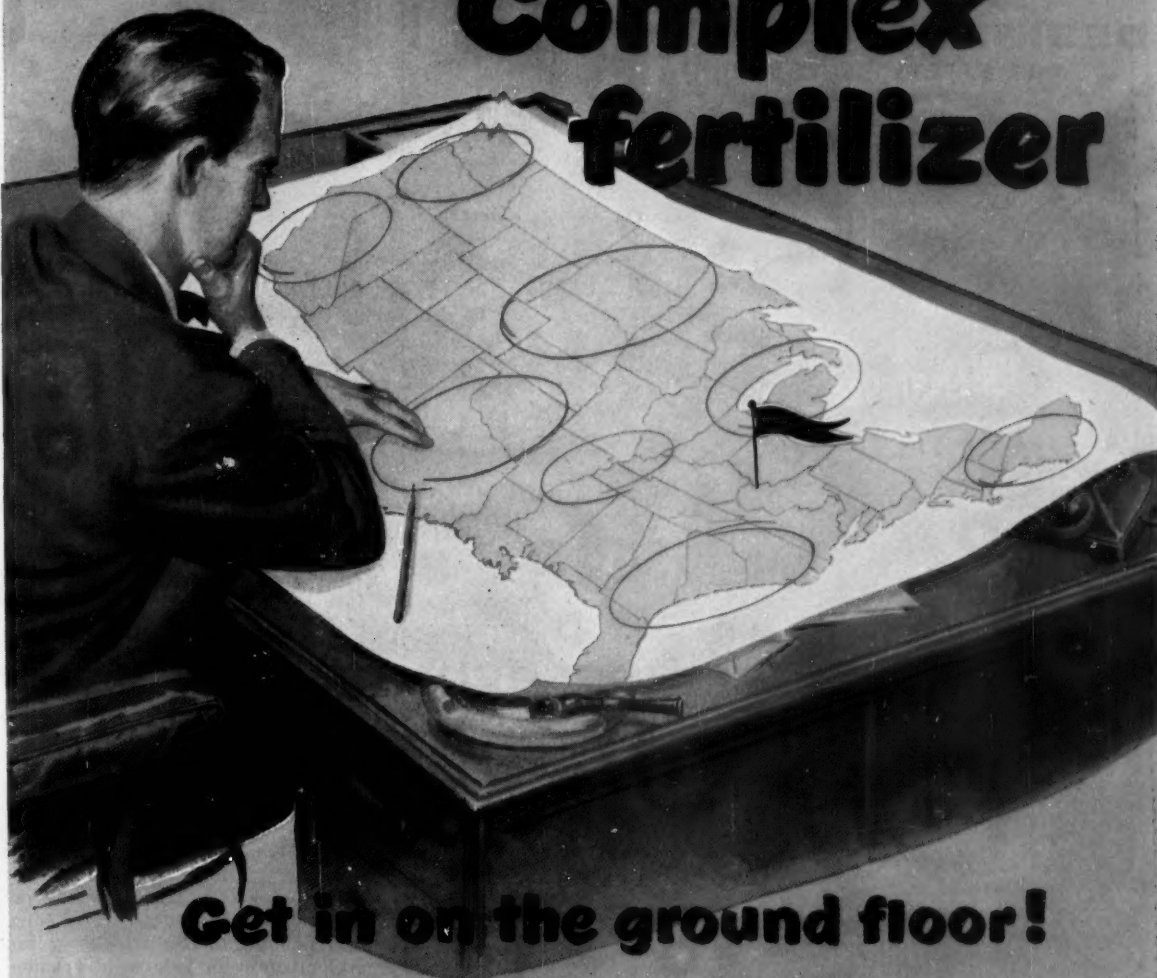
- The board has ordered American Cyanamid Co. to pay for fish that died in the James River last July; Cyanamid's titanium pigment plant is located on the Piney River, which flows into the Tye River, which empties into the Buffalo River, which is a tributary of the James. State and company officials are to negotiate the amount of the payment.

- In the case of the Virginia Dyeing Corp., the board is threatening to bring a lawsuit to force compliance with the board's 1952 order that the company prepare plans and specifications for a waste treatment plant for the company's works on the Meherin River near Emporia.

- **Explosion Liability:** Both the Senate and the House of Representatives have accepted the principle that the federal government is liable for damages resulting from the 1947 ammonium nitrate explosion at Texas City, Tex.; but the two houses didn't have time to work out a compromise on the procedure for paying the more than \$60 million worth of claims. As a result, the Thompson bill to authorize payment of the claims died when the 83rd Congress closed its books—but it's certain to be reintroduced in the new Congress next January.

Under the House version, the Secretary of the Army would be authorized to determine how much should be paid to each claimant, and to go ahead and write the checks. The Senate would have required the Secretary to investigate each claim and recommend how much should be paid, but it would be up to Congress to accept or reject his findings.

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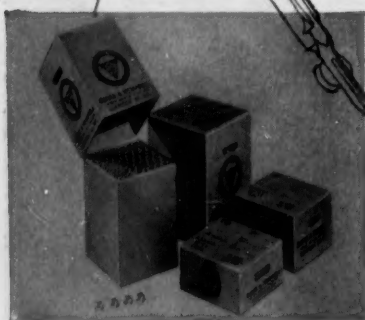
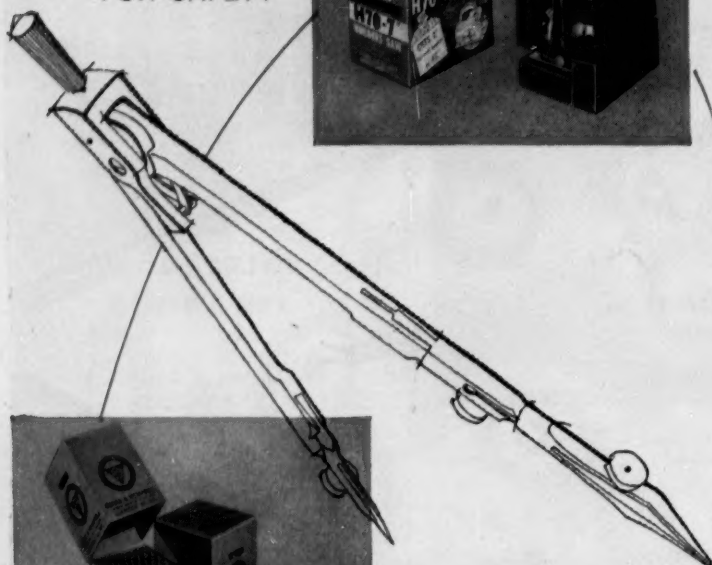


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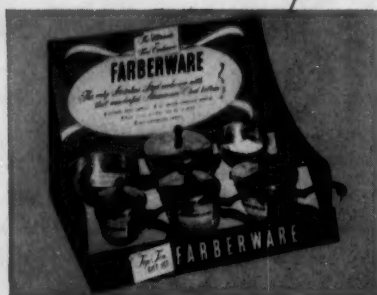
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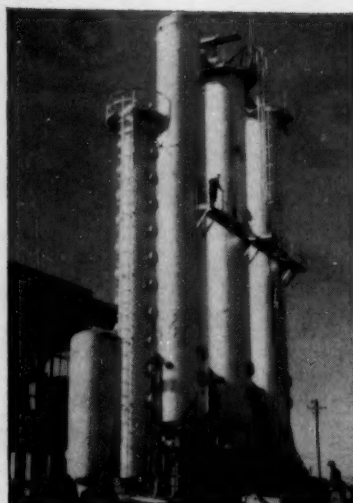
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B & I



MORWELL PROJECT: For Melbourne, coal gasification plant is now going up.

FOREIGN.

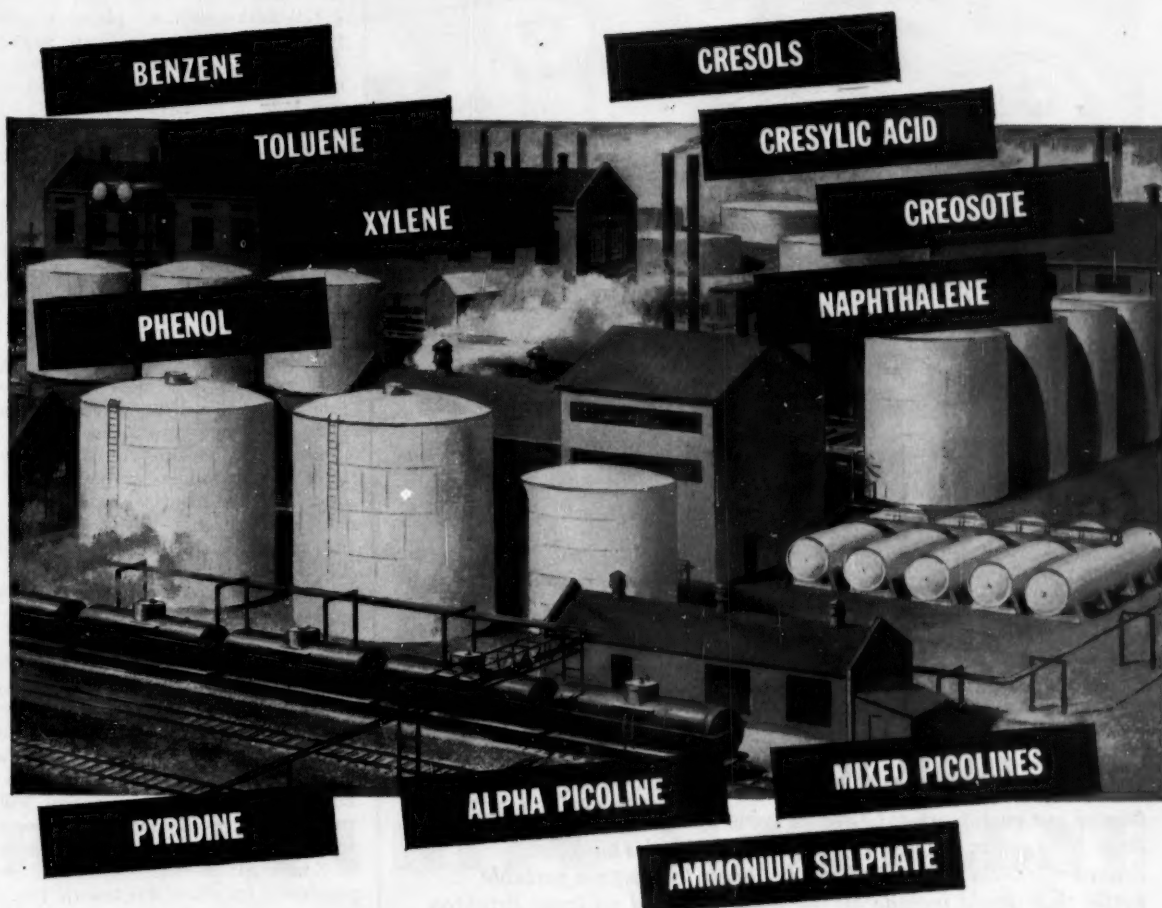
Gas/Australia: If construction work continues as scheduled on the Morwell brown coal gasification project in Australia, Melbourne will have a trouble-free gas supply for the first time in a generation. Initially the plant will blow 15 million cu. ft./day—40% of Melbourne's gas needs; an eight-fold production increase by 1975 is planned.

Sulfur/Mexico: The Mexican government has granted the Texas International Sulphur Co. a 90-day extension of its Sept. 7 deadline for selecting over 16,000 additional acres for sulfur exploration in the Isthmus of Tehuantepec.

Sulfur/Sicily: Countermanding its previous decision, the sulfur industry in Sicily has decided to keep its mines open for business as usual. Causing the change in attitude: a government decision to authorize the Bank of Sicily to lend the Ente Zalfi Italiano (Italian Sulfur Board) 1,000 million lire. Industry representatives, however, are not convinced that the move will be the answer to their problems. "Only a steep rise in world sulfur prices," admits one company representative, "will ever make Sicilian sulfur mines pay again."

Plastics/Turkey: With the backing of Turkish banks, the Italian Pirelli Co. has formed an affiliate in Turkey to produce rubber and plastic goods. Capital: \$7.1 million. Two plants are planned for immediate construction: one, to produce tires and insulated cable; the second, to produce plastic

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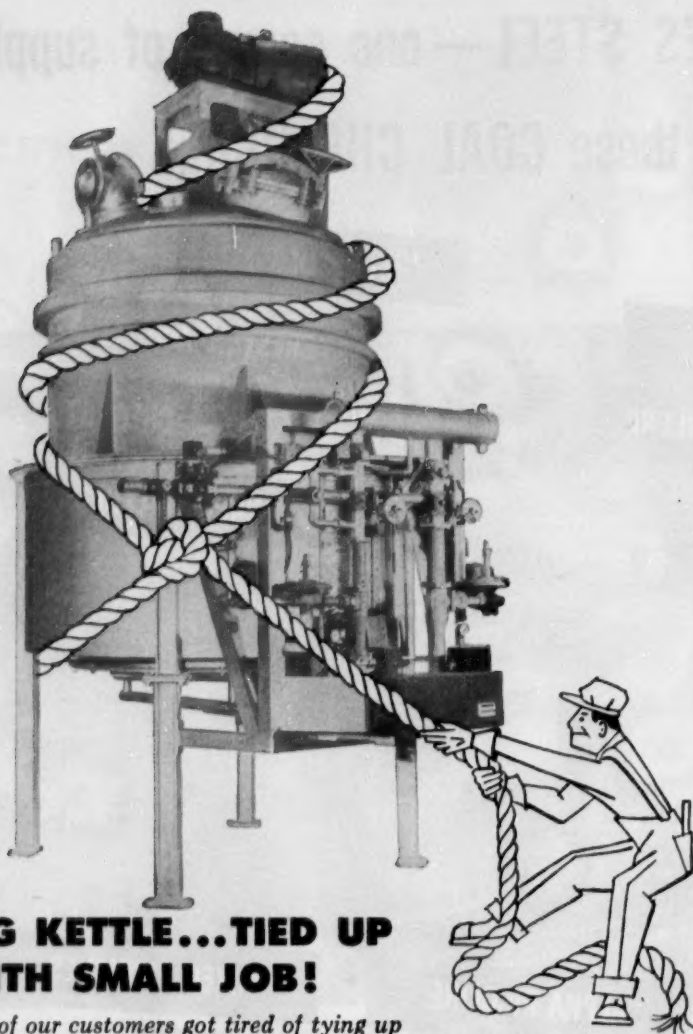
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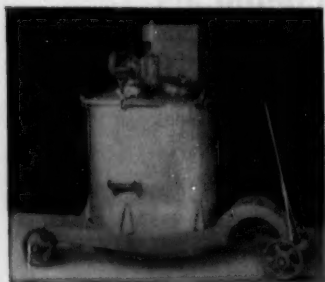
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products for general consumption. No estimated dates of completion have as yet been scheduled.

Soda Ash/India: The government of India has revealed its plans to build a \$10-million soda ash plant—in order to reach its 5-Year Plan target—150,000 tons annually by 1955. Indian consumption is now close to 120,000 tons year, is likely to be over 155,000 tons by 1955. And existing units (run by Tata Chemicals and Saurashtra Chemicals) although enlarging capacity from 55,000 to 80,000 tons/year, won't be able to cope with all needs. Destined to feel the backlash of the government's decision: U. S. soda ash exporters—who annually ship 70,000 tons to India.

Chlorine/South Africa: African Explosives and Chemical Industries, Johannesburg, will build a £2-million plant at Umbogintwini in Natal to produce a wide range of chemicals—from caustic soda to polyvinyl chloride. The new plant is expected to be partly in operation by next summer, and in full production by the end of 1955. Principal product: chlorine—for use in Natal's paper mill and rayon pulp plants.

Oil/South Africa: South Africa's oil-from-coal project at Sasolburg (costing \$84 million) will start producing 55 million gal./year of oil sometime within the next 12 months, company executives say. Spokesmen are confident that the entire operation will prove to be profitable and the forerunner of further such developments in South Africa—where coal can be purchased for about 43¢/metric ton.

KEY CHANGES . . .

A. E. Moyer, to vice-president, Snyder Chemical Corp., Bethel, Conn.

F. A. Jolles, Herbert W. Mason, Jr., and Patrick J. Ryan, to directors, Reichhold Chemicals, Inc., New York City.

George F. Klein, Jr., to manager, Process Engineering Dept., Catalytic Construction Co., Philadelphia.

Albert H. Gower, to general sales manager, Warwick Chemical Co., Long Island City.

George Rieger, to coordinator, Market Research, Diamond Alkali Co., Cleveland.

Joseph J. Tumpeer, to senior vice-president, Witco Chemical Co., New York.

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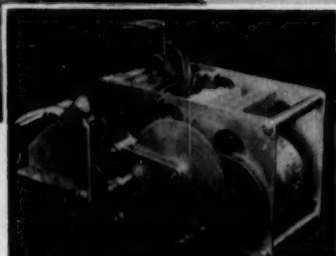
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A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

September 4, 1954 • Chemical Week

39

PRODUCTION



Planners* (above) pore over their digital converter (inset). It speeds logging, yield calculations. It's another . . .

will present an entirely different picture. The big room and the hundreds of instruments mounted on a panel will be replaced by a room just big enough to house a console desk. Centralized circuits, handling many inputs sequentially, will appreciably cut down the number of components. And the one operator that's necessary will be there solely to control the process.*

Reduction of over-all instrumentation is not limited to the indicating devices. In the case of flow integrators, for example, Fischer & Porter employs a single circuit that integrates up to a hundred flow rate inputs simultaneously. This, it claims, costs far less than using 100 separate instruments. The firm also feels that the single unit has a costwise edge on maintenance.

Mechanical Assist: But the big advantage of automatic logging, as both Fischer & Porter and Beckman see it, is that the operator does fewer routine chores, does more process supervision. Between logging intervals, the logger can be used to scan inputs, reporting only selected or abnormal values. Records of process variables can, of course, be very important during times of upset and are often missed in

Link in the Control Chain

The chemical process industry, which has adopted instrumentation as an engineering science, will soon have a new tool to work with: digital data-logging equipment to absorb and correlate the overabundance of process information. Fischer & Porter Co. (Hathoro, Pa.) and Beckman Instruments, Inc. (Fullerton, Calif.) now offer data loggers as standard equipment, have set up special instrumentation groups to engineer data reduction systems.

Fischer & Porter is readying a digital logger for November installation at Esso's Bayway, N.J., refinery, claims it is the first to be designed for a production process. Robert Stern, manager of the new Data Reduction & Automation Div., reports that many chemical manufacturers, as well as several other refiners, are interested in the new systems.

Beckman, meanwhile, is delivering its first logger to an Esso pilot plant at Baton Rouge this month, has a second one scheduled for another refinery early next year.

Building the Chain: Data reduction is not a new idea. For that matter, neither is automatic logging, which has been used for some time to record experimental data that's similar in nature and range. It's been used,

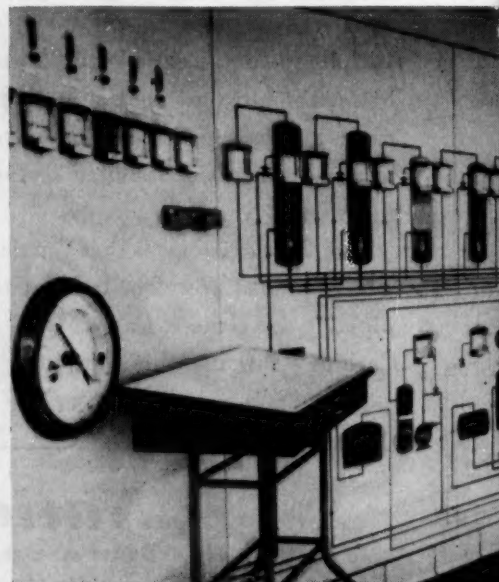
for example, to log pressures in wind tunnels. What is new for the process industry is the unique combination of the two basic principles into one unit capable of handling a variety of inputs.

Probably the best way to assess the impact of the new data reduction system is to look at the control room of any modern refinery or chemical plant. It's usually a big room with hundreds of dials, charts and meters lining the walls. If it's equipped with the latest improvements in graphic panels with miniaturized, multi-function instruments, the components are small. But they're so numerous, they still take up a good deal of space.

And in spite of the many advances that have been made toward complete automatic control, today's control room depends on human supervision to carry out its function. One or more operators are required to read the indicators, interpret the charts, log the data for permanent records, and control the process.

If the men who are engineering the new data reduction systems have their way, the control room of the future

* In the fully automatic plant, of course, the single remaining operator would be replaced by a calculating machine that, after being fed the proper instructions, would digest the variables, then adjust the operating conditions. That's possible right now for only a limited number of processes, information on which is well established.



SWITCH: Instead of space-filling

* L. to r.: Pierce Hollingsworth, chief mechanical engineer; Joseph Warner, chief engineer of Data Reduction & Automation Div.; Jack Roback, project engineer, all of Fischer & Porter.

manual logging when supervisory personnel are occupied elsewhere.

Briefly, here's how the digital logger works: at required intervals, or upon demand from a manual signal, analog inputs from the primary measuring instruments are converted to absolute digital units, printed automatically on a column log in the proper sequence. For example, point number one might be a thermocouple recording a feed temperature of 234 F. To accomplish digital read-out of this value:

- The thermocouple voltage is fed to a self-balancing potentiometer.
- The potentiometer shaft positions a train of coded drums in the Digi-Coder, an electrical-mechanical digital converter. Solenoid-operated feelers drop onto circumferential hills and valleys of the drums and, by means of a combination of open (valleys) and closed (hills) electrical contacts, transmit a coded electrical signal representing the digits 2 - 3 - 4.
- An electric printer—the Flexo-writer—operated by the coded signal, types the number “234” in column one (feed temperature, deg. F) on the log, simultaneously records the value on punched-tape.

Logging speeds of up to 2,000 points in 10 minutes are possible with the use of rapid full-scale deflection components and digital memory circuits to minimize time lost during the printing cycle. For general purposes, however, the logger will operate at the rate of 100 points in five

minutes to permit the use of slower-acting elements of more rugged construction that require less maintenance. At any speed, the accuracy of the system is high—plus or minus $\frac{1}{4}\%$ of full scale for the electrical circuits, one digit in the Digi-Coder output, regardless of the number of digits.

One of the most important advantages that data reduction offers is the savings in time required for calculations based on recorded data. Determination of yield costs, for example, may be delayed by as much as 24 hours using present methods of computation. Graphic charts must be planimeted manually, values transcribed and transferred to punched cards suitable for use in electric calculators. And compounded errors often amount to 5%. The punched-tape record from the data logger bypasses the manual operations, rapidly feeds accurate digital data to card-punch machines that automatically set up the information in the form required by the calculators.

With a Difference: Beckman's 44-Channel Data Handling System is fundamentally similar to Fischer & Porter's, differs slightly in the method of utilizing the output. The coded signal from the digital converter is simultaneously logged by a special IBM electric typewriter, made available to an IBM serial card-punch machine, and indicated on a visual panel. The read-out time is three seconds per channel.

Each unit will have to be designed for the specific job it has to do, but basic components are standardized as much as possible to minimize engineering costs. Fischer & Porter estimates that systems for handling 50 to 500 inputs will cost about \$10,000 to \$40,000, depending on the number of circuits and special features used.

Cost comparisons are necessarily difficult. However, Beckman's selling price will be in the same neighborhood. A 50- to 200-input installation will probably go for between \$10-30,000. But with extras, the price for a 300-input unit could easily go to \$75-100,000.

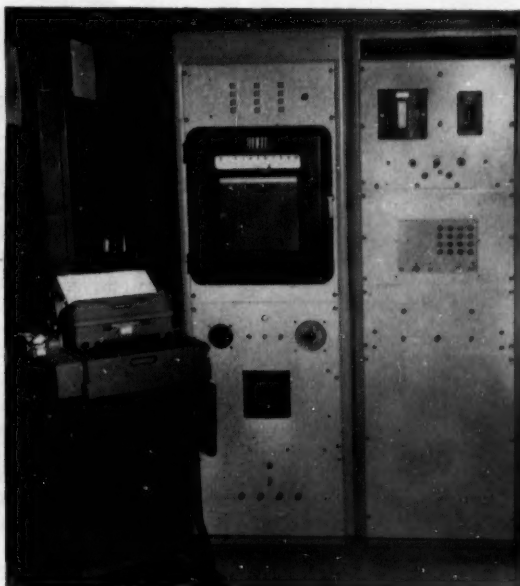
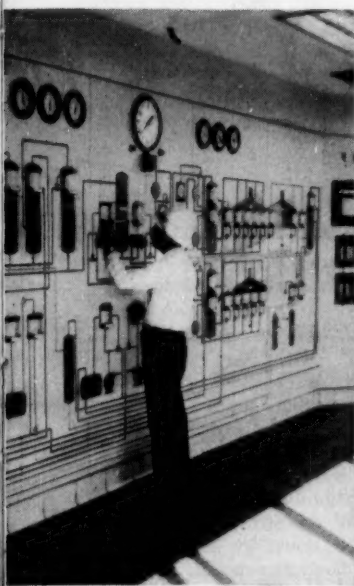
And both firms feel that the initial investment will be returned in short order. Says Beckman Division General Manager Jack Bishop: “The equipment will pay for itself in six months to a year in clerical savings alone. And it will do a lot of things that can't be done any other way. For the first time, the chemical industry will be able to use all the data it can accumulate.”

Patent Offer

Part of its program to make nonsecret technological information available to industry, the Atomic Energy Commission last week released from security wraps 25 more government-owned patents, brought its unveiled total to 704. The patents, offered on nonexclusive, royalty-free licenses, included many directly relating to the process industry.

Among those almost sure to catch a second glance from most production men:

- No. 2,680,227, which describes a new polarscope for use in the electrochemical analysis of electrolytic solutions. During a predetermined fraction of the interval between the birth and breaking off of a mercury drop at the tip of a capillary electrode, says the patent, the solution automatically produces a visual polarogram on the scope.
- No. 2,682,352, which covers the construction of a shipping container for radioactive material. According to the patent, the container has a dust-tight sealed cap that prevents the escape of radioactive materials but permits the release of gases formed during neutron treatment.
- No. 2,682,364, which details an electronically controlled gas pumping system of the Toepler type. Electronic means, relates the patent, are provided to alternately apply pressure to and evacuate the fluid pumping apparatus.



control panels (left), a compact automatic logger (right) speeds the job.



TRADE TOOLS: Sparking gun, kindling, kerosene are Chief Crispin's trappings for his 'day of misrule'.



IGNITION IMPETUS: After guarding the plant for 20 years, Crispin takes new role, spreads kerosene on scrap lumber to speed flames.

Lord of Misrule

From the series of pictures, it would be hard guessing that the fellow about to burn down 125 buildings is Fire Chief William Crispin of Du Pont's Repauno Works dynamite plant at Gibbstown, N.J.

Like the old English Lord of Misrule who held reign at Christmastide, Chief Crispin ruled over a reversed kingdom, burned down more than half of the buildings of Du Pont's oldest dynamite plant—which he has

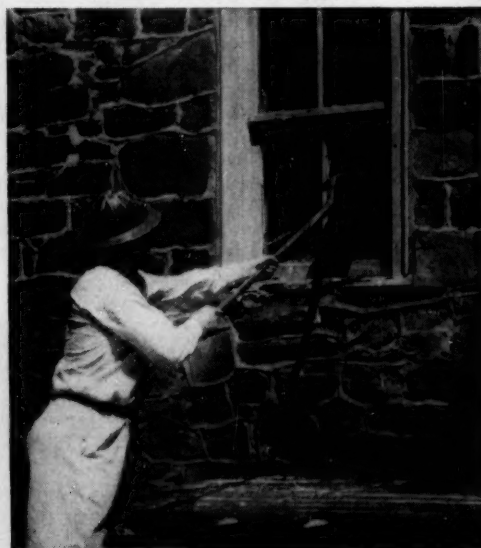
guarded against fire for nearly a quarter of a century. The company, having opened a new dynamite plant elsewhere, no longer needed the Nepauno structures.

Over the years, powder had been ground into wooden platforms, walls and floors; Du Pont decided that the buildings were too dangerous for mere abandonment, ordered them destroyed. Crispin and his crew were handed the job, turned their hands to



CONTROLLED CONFLAGRATION: Fire Chief Crispin, back in character, plays hose on buildings to be saved as fire razes the rest.

WIDE WORLD PHOTOS



HELPING HAVOC: To create a draft for the flames, Crispin smashes in windows.

it with the aplomb of professional arsonists.

Using the tools of their criminal countertypes—sparkling gun (matches are forbidden in the plant), lighter fluid, kindling and kerosene, the group set fire to the buildings, spread kerosene on scrap lumber to speed the flames. Some of the structures to be saved were wet down by fire hoses while the conflagration raged. Now cleared, the area is safe and ready for any future Du Pont has in store for it.

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Eastman's new film former

A LOW-VISCOSITY CELLULOSE ACETATE BUTYRATE FOR FORMULATIONS REQUIRING HIGH NON-VOLATILE CONTENT

The introduction of half-second butyrate has greatly broadened the usefulness of cellulose acetate butyrate in protective coatings.

Eastman's announced production of this low-viscosity film former brings you the outstanding advantages of cellulose acetate butyrate in a new form—a more soluble form—one that permits its use in formulations requiring a high non-volatile content. The high solubility of half-second butyrate, plus its slow viscosity build-up in economical solvents such as toluene and ethyl alcohol, opens up entirely new fields to this unique cellulose polymer.

Half-second butyrate is a dry powder, safe to ship and easy to handle. It produces films of low color and high clarity with excellent strength and flexibility at both normal and low temperatures. Extremely stable in the presence of ultra-violet light, half-second butyrate films retain

their initial low color, high strength and flexibility for long periods, indoors or out. No other easily sprayable film former exhibits these characteristics to such a high degree.

In addition, half-second butyrate films possess excellent abrasion resistance and are little affected by prolonged underwater immersion or rapid temperature changes.

Even if you are already familiar with the older cellulose acetate butyrate types, it will pay you to re-appraise its properties in the light of this new development. Samples of half-second butyrate and formulation suggestions are available on request.

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Kingsport, Tennessee

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BTC

824

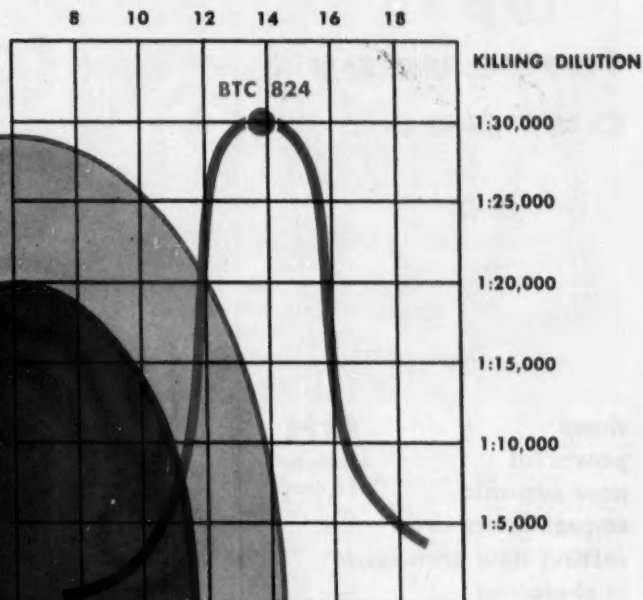


BTC 824 is a 50% aqueous solution of alkyl dimethyl benzyl ammonium chloride and is a cationic quaternary ammonium surfactant of unusually high bactericidal activity. At ordinary use concentrations it is odorless and colorless. It has a wide range of sanitizing and deodorizing applications, in the dairy, food processing, meat packing, baking, food service, beverage and fermentation industries; surgical instrument disinfection; as an algacide in swimming pools and circulating water systems, etc.

Complete data on BTC 824 and other ONYX quaternaries—the largest variety available—will be sent upon request.

RELATIONSHIP BETWEEN CHAIN LENGTH AND
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NUMBER OF CARBON ATOMS IN ALKYL CHAIN



Composite curve based on data
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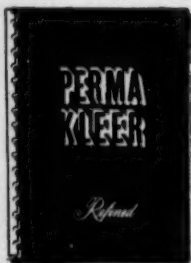
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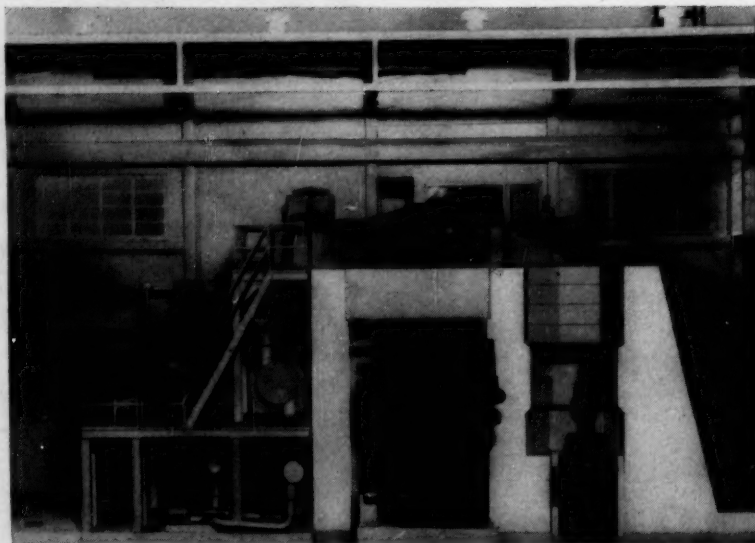
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PRODUCTION



PLANT MODEL: For remote bases, airborne atomic power.

Airlift for Atoms

The Nautilus proved that an atomic power plant could fit inside a submarine hull, could serve as a practical power source. After two years' study, Army engineers saw no reason why a similar plant could not serve as a landlocked power and heat source at remote bases, be compact enough to be airlifted in sections. Last week, the government gave the estimated \$8-million-minus experimental project the go-ahead (CW Newsletter, Aug. 28).

The plant, patterned after a model displayed at the Pentagon last week (see cut), will be built at Fort Belvoir, Va., by private industry. It is the first atomic power reactor on which the government is calling for competitive bids instead of letting the contract on a negotiated cost-plus basis. Construction is slated to start this fall with actual plant operation scheduled to begin within three years.

Invitations to bid have already gone out; the bids themselves must be submitted within 90 days (CW Newsletter, Aug. 28). The government will then select the bid most favorable "from the standpoint of price, excellence of design, and responsiveness to other aspects of the invitation."

Packaged Power: Known as the Army Package Power Reactor, the prototype plant is designed to produce 1,700 kw. of electricity; when fully assembled it will fit inside a building 29 ft. wide, 80 ft. long, 42 ft. high. The finished power unit will consist of the reactor, heat exchanger, steam condenser, feed heater, steam turbine

and electric power generator; fuel will be highly enriched uranium.

Scientists at Oak Ridge National Laboratory worked out the preliminary design. Similar to the pressurized water reactor of the Nautilus, the unit will work like this: the reactor (lower right, in cut), fed with uranium, heats water circulated through a closed loop at high pressure. The heated "hot" water passes through a heat exchanger (center), where it gives off heat to other, nonradioactive water in a separate closed loop. Under reduced pressure, water in the second loop is converted into steam, part of which is used for heating. The rest of the steam is piped to a turbine (top center) that runs an electric generator (top center). The steam is condensed (left). The water is pumped through the heat exchanger to start the cycle again.

Admittedly, the experimental reactor will produce high-cost electric power. But at remote bases such as those in Greenland and the Arctic, the government believes the cost of atomic heat and power could prove competitive with that of the bulkier conventional fuels that must be airlifted in. (At some Arctic bases, airborne oil runs as high as \$42/bbl.)

Moreover, scientists and engineers alike expect to gain a great deal of information that will prove valuable in the design and construction of future reactors. And the reactor will be used at the Army Engineer School in Fort Belvoir to train officers in atomic power technology.

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Di-n-Butyl Amine	129.24	0.7613	159.6	0.47	6.2
n-Hexyl Amine	101.19	0.7675	131.8	67	1.2
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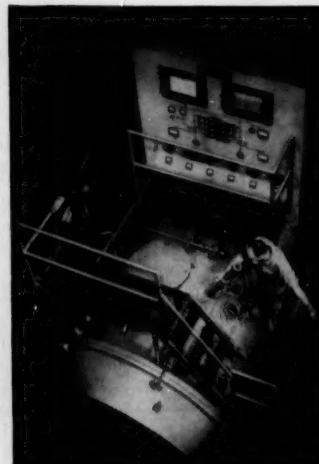
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PRODUCTION

EQUIPMENT

Atom Counters: Model 312 high-voltage supply is being offered by Atomic Instrument Co. (Cambridge, Mass.) for use in scintillation counters. It is a 60-cycle AC transformer type of supply, has a variable output of less than 200 volts to more than 1,400 volts. Maximum current output is one milliamper.

• A selective scintillation counter that counts alpha particles but not other radiations has been put into production by National Radiac Inc. (Newark, N.J.). The unit contains a closely packed monolayer of alpha-sensitive phosphor covered by aluminum foil; this arrangement, says the firm, is transparent to alpha particles but not to light.



Exhausted Atmosphere

WORKER at Utica Drop Forge & Tool Corp. (Utica, N.Y.) checks in the firm's new 1,000-lb.-capacity vacuum furnace. One of the biggest yet made, it is 3 1/2 times larger than Utica's next size vacuum furnace, is the first of twin units to be delivered by F. J. Stokes Machine Co. (Philadelphia). Output from the furnaces will be high-purity alloys for later use in jet-engine turbine blades.

Melted in a vacuum, these alloys, say Utica metallurgists, will have 2 1/2 times greater stress-rupture strength than material from conventional electric arc furnaces, will be better able to withstand the strain of sound-speed flying.

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ATLAS

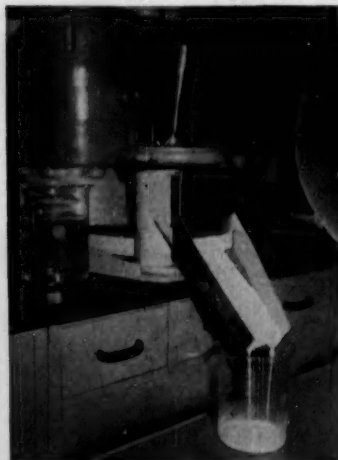
CHEMICALS DEPARTMENT
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Effect of adding oil to O/W emulsion

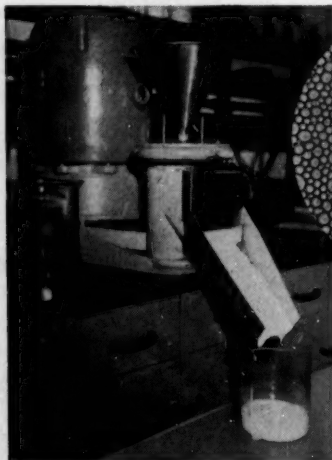
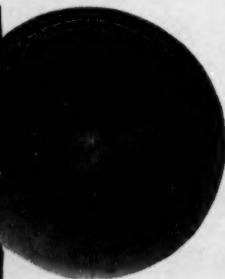
An oil-in-water emulsion becomes more viscous as increasing amounts of oil are added to the mixture. The individual particles of the internal or dispersed phase become more tightly crowded as their number increases. Thus, an emulsion can be made to almost any consistency, from thin to heavy-bodied.

To demonstrate this effect, a series of photographs taken

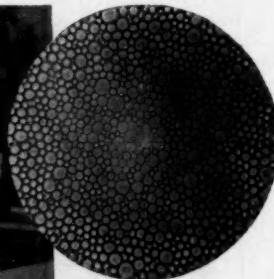
in the Atlas Laboratories are shown here. These illustrate the change in viscosity when 3000 cc. of oil are added to 300 cc. of water-emulsifier mixture, in successive steps of 25%, 50%, 75% and 100% of the oil. The corresponding photomicrographs reveal the increased mechanical crowding of oil particles, which causes the structural change in consistency.



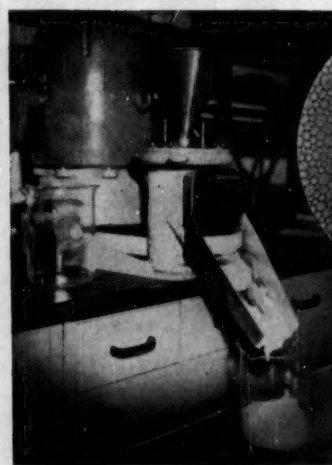
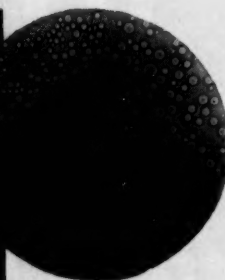
750 cc. of oil added. The emulsion is a free-flowing liquid.



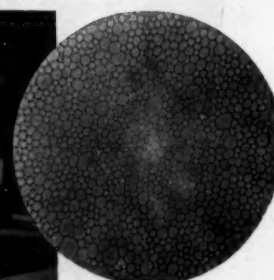
2250 cc. of oil added; note how emulsion sticks to trough.



1500 cc. of oil added; emulsion is thicker, but still flows readily.



With 3000 cc. of oil dispersed, the emulsion is dense, heavy-bodied.



A parallel effect is obtained in water-in-oil emulsions; that is, as water is added to an oil-emulsifier mixture, the resulting emulsion increases in viscosity.

To assist in the formulation of your emulsions, Atlas offers a varied line of surface active agents, and technical assistance in applying them in your specific product.



HOW TO TEST SORBITOL FOR COSMETIC USE

A "wrist test" tells you very little about sorbitol's properties as a cosmetic ingredient. In fact, it is misleading. Sorbitol solutions by themselves are thick syrups that feel slightly sticky to the skin . . . but behave differently when used in a finished formula.

The only conclusive way to test sorbitol is to try it in your product. Far from making a cream feel sticky, sorbitol produces a smooth, dry feel. Test its humectant properties, by exposing sample creams to various humidities and observing the weight loss. You will find, as we have found in our own laboratory investigations,

that creams conditioned with sorbitol lose moisture much more slowly than those made with other humectants.

We'll be glad to send you samples of sorbitol for your own research. And to assist you in formulation, we have prepared an 86-page booklet entitled "A Guide To Cosmetic and Pharmaceutical Formulation with Atlas Products." This booklet includes 96 different cosmetic and pharmaceutical formulas which have been thoroughly tested in the Atlas Laboratories. We'll be glad to send a copy to executives and research men who write to us on their company letterhead.

The function of sorbitol in cosmetic creams

Stabilization of moisture content is generally considered the principal reason for incorporating a humectant in a cosmetic cream. In this respect, sorbitol is particularly effective. Its low equilibrium moisture content, and its slow rate of moisture gain or loss, retard dryness and the formation of crust when the cream is left exposed to the air.

Another major use of sorbitol is to provide smooth application of the cream. Sorbitol, by its humectant nature, releases water more gradually from the emulsion as the cream is applied, providing a spreading or lubricating action that prevents "roll."

The humectant also helps to impart a good cosmetic feel on the skin. Materials that are too hygroscopic produce a damp or sweaty feel. Sorbitol, because of its low equilibrium moisture content, gives a desirable smooth, dry effect. In foundation creams, the heavy body and high viscosity of sorbitol are advantageous in making a cream that will provide good adhesion for subsequently applied powder.

The moisture stabilizing properties of sorbitol are of particular benefit in oil-in-water emulsions, especially in soap emulsified creams. The superior cosmetic qualities produced by sorbitol, however, are equally advantageous in both W/O and O/W creams. For further information, write for a copy of the article, "Hygroscopic Agents in Cosmetics."



McCONNELL (r), ASSTS. SMITH (l) & CARROLL: Their new system tells . . .

How to Rate a Salesman

"All roadblocks have been pushed aside . . . some benefits already noted."

The question of evaluating sales performance, always a knotty and elusive matter, has been looming ever larger of late. Chemical company sales management, wrestling with selling expanded output, finds itself trying to pin definite, tangible solutions to an inherently intangible problem.

And although some formal programs have been established, the difficulties of applying a scientific approach to such a shadowy goal are many. Some roadblocks: lack of guideposts, the press of daily affairs and the question whether it is really practical to try to evaluate a salesman's worth.

At Diamond Alkali Co., however, all the roadblocks have finally been shoved aside, a years-in-developing program has just swung into formal action.

Diamond's sales vice-president, William McConnell, has been patiently pushing a sales evaluation program as far back as 1947. A successful test of part of the project was made in 1951. Branch managers started to utilize the full program in the fall of 1952. Finally, within the past few weeks, the salesmen were given a full-dress account of all the details.



"Top management interest in salesmen's problems has boosted morale."

Aims and Hits: The program, which combines a qualitative and quantitative analysis of each salesman's performance, has three basic aims:

- To let each man know exactly what the company wants him to do—where and when to apply extra sales efforts, what type of customers to cultivate, etc.

- To enable the company to measure its selling costs more accurately.

- To determine how efficiently each man is performing and help him improve his performance.

Some benefits of the program have already appeared. A few of these:

- The number of new accounts has increased as the result of more intelligent deployment of sales manpower.

- Some accounts have been revealed as being uneconomic. These have been removed from the salesmen's bailiwick and other means of reaching them—usually via distributors—have been substituted.

- Branch managers have spotted weaknesses of individual salesmen and needled them into more fruitful effort.

- Morale has been boosted. Reason: the salesmen realize that top management is showing an active interest in their problems and performance records.

More tangible results will probably not unfold for at least six months. And even then, the company doesn't expect them to be measurable in, say, percentage increase. But it does feel confident that with attention being given toward improving performance, over-all company sales will show a definite uptrend.

Chain of Command: To understand how the system operates, it's necessary to know the Diamond sales network.

Briefly, it's composed of:

- The field sales force—about 80 men. For the most part, these men sell all products of all company divisions.

- Nine sales territories covering the country, each headed by a branch manager who reports directly to the sales vice-president (McConnell) in



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Cleveland and who exercises line authority over his own men.

- Division product sales managers, who carry staff authority and establish policy (along over-all company policy lines) for the sales of products of their own division. They have no direct control or supervision over the field force.

Nearly all Diamond's sales are handled direct. Distributors are employed, however, in certain industries—such as laundry, dry cleaning and dairy, where supply houses can distribute more efficiently, or where geography or a local situation makes it competitively unwise to sell direct.

Between 80-90% of the company's tonnage is sold on contract; the remainder is comprised of uncontracted less-than-carload and spot sales. (Unlike salesmen in many companies, Diamond's men handle l. c. l. sales direct.)

Performance Elements: All these factors were taken into consideration in establishing the sales evaluation framework.

As finally constructed, Diamond's program rates performance in these three elements:

- Element No. 1 is a qualitative, twice-a-year appraisal by the branch manager and McConnell of each salesman's performance, abilities and attitudes toward the fundamentals of good selling skill, team spirit and industriousness.

- Element No. 2 is a periodic measure of sales volume for each man, expressed in terms of the relationship between his sales volume and controllable selling costs.

- Element No. 3, likewise periodic, is a measure of sales volume in terms of gain or loss for comparable periods.

Quality Rating: The first, qualitative factor caused McConnell and staff

"The program . . . combines a qualitative and quantitative analysis of . . . performance."

the most headaches. When McConnell started thinking of sales evaluation, he first explored the possibility of scientific standards of judging the quality of a salesman's efforts.

He found practically no guideposts in the field. Furthermore, the sales managers he talked with were nearly unanimous in asserting that "seat-of-the-pants" judgment was the most practical way of evaluating sales performance.

Unconvinced, Diamond called in consultants McKinsey & Co. to help set up a qualitative yardstick. In May '51, the first questionnaire went to



branch managers with a request to evaluate their men by it.

When the results came in, the home staff took a critical look and, with a couple of changes, adopted it.

As it now stands, the appraisal breaks down into eight areas: attitude toward company and job, personal development, trade relationships, new

"If it's necessary to change any phase of the program, we're ready."

industry penetration, special assignment handling, supporting activity of other men's accounts, promptness and accuracy of reports, credit handling.

In effect, the qualitative rating sets up a common eye through which branch managers look at their salesmen. And though personal judgment still enters into the scoring, the fact

that someone at headquarters also scores each man tends to be a check on the judgment of the branch manager.

Latest move in quality rating came early this month; element-1 questionnaires were handed to all Diamond salesmen for them to make their own personal evaluations.

When these are completed, the branch managers will sit down with each man and discuss the results. In that way, McConnell is confident, the men and managers will be able to air individual deficiencies and tensions and work out a constructive program for improvement. In making the questionnaire available to salesmen, management stressed heavily that while it considers the sales force to be a good one, there is always room for improvement and the company wants to help the salesmen improve for their own and Diamond's benefit.

Quantity Scores: The two quantitative elements of the program were set up with the help of the company's accounting department. In element 2,

"Just average effort is not a satisfactory standard of performance."

the number of tons each man has sold the previous period in each product group is multiplied by a series of point values. Point values are arbitrarily established at headquarters and are, McConnell admits, the most vulnerable part of the program. However, they are subject to constant review so they will reflect actual selling situations as nearly as possible.

The point value of a product takes into account a number of factors: relative sales effort required to sell each product (specialty items have a higher





This Koppers Chemical goes on a picnic

A little-known chemical plays an important role in the family picnic. It's in the potato chips, in the meat casing on the hot dogs, in the peanut butter, the doughnuts, the salad oil, the bread wrapper and in the wax paper bag holding the potato chips—even in the dishes. It's called **dbpc** antioxidant.

Virtually all foods containing fats and oils are highly susceptible to turning rancid and spoiling. **dbpc** (di-tert-butyl-para-cresol, also known as butylated hydroxy toluene) will protect such foods against oxidation,

stabilizing them in texture, color, odor and flavor. Extremely small amounts are needed—as little as 1 part in 10,000.

Plastic picnic set in the scene shown above contains **dbpc**, too, for this Koppers antioxidant is widely used to prevent discoloration in certain plastic products.

In the young man's car, the gasoline and lubricants may well be protected against sludge and oxidation

by this versatile inhibitor. Furthermore, **dbpc** may have been used in the manufacture of his white-wall tires to prevent discoloration.

Of course **dbpc's** uses are not limited to picnics. Like other members of the Koppers family of chemicals, it serves many industries as well as the consumer. If you would like to know how **dbpc** may help brighten your production picture, just drop us a note.

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point value, for example, than commercial items, because experience has shown that it takes more time and effort to sell them); the greater difficulty in selling equal tonnage in l. c. l. quantities than in carload lots; the fact that greater amounts of certain product groups must be sold in order to maintain a balanced sales picture.

When tonnage point value has been calculated, it is divided by the salesman's total controllable expenses, including salary, car, travel, entertaining. (Factors over which the salesman has no control are not figured in the element at all—things like the pricing of products, manufacturing costs, the decision to concentrate sales effort on selling one group of products that might be more profitable than another.) The result is a relationship figure that indicates the relative de-



gree of sales effectiveness in terms of the major part of controllable sales costs.

To compute the score for element 3, the salesman's volume for the month is calculated in tons and valued by the same point value system used for element 2. A relationship is established by dividing point values for the current period by point values for the previous period.

Total score for each element is then divided by "par"—the "average-above-average" score on a territorywide basis. That is, total scores of each salesman in the territory are added and the sum divided by the number of salesmen. All scores above average are then added and divided by number of salesmen in the above average group to establish par. Reason for the average-above-average method, as McConnell explains it: "Just average effort is not a satisfactory standard of sales performance."

Finally, the weight of each of the elements is applied—25% each for elements 1 and 3 and 50% for element 2—to arrive at a final composite score.

Enter the Salesmen: The branch managers have been using the program since the fall of 1952. Early this summer McConnell's two assistants, Olin Smith and Charles Carroll, took the final step. In group and individual conferences, they explained the aims and mechanics of the entire system to all the salesmen.

Then the branch managers entered the picture. In individual conferences with their men, they pointed out—and backed up with figures—how the salesman can make better use of his time, new areas worthy of exploration, strong and weak selling points.

McConnell points out that an alert manager can learn a great deal about his sales picture and his men's performance through careful analysis of the figures.

The program is not an automatic compensation plan. But, because Diamond salesmen work on salary with merit increases recommended by the branch managers, their ratings will

**"An alert manager can
learn a great deal . . .
through analysis of
figures."**

have an indirect effect upon their incomes.

Road Ahead: Though McConnell is pleased with the program as it now stands, he is quick to admit that it isn't perfect. "If it is necessary to change any phase of the program, we're ready to do so. We want it to be flexible and reflect the needs of the salesmen."

"We've put a lot of thought into making the system scientific and fair, but we realize there are areas that need further exploration. For example, we debated long over some method of evaluating territory potential. To date, we're satisfied that intelligent deployment of manpower by the managers is as good a control as any arithmetical evaluation."

"We still may be able to extend the system to this area, but it will be extremely difficult in view of the rapid changes taking place in plant locations of consumers and producers, and new technologies and product uses."

His seven-year project finally whipped into shape, McConnell feels confident that Diamond is now ready to tackle any sales evaluation problems in the more competitive period ahead.



Paint manufacturers have been quick to recognize Reichhold Chemicals' "Wallkyd" as a versatile, inexpensive and easily handled alkyd resin vehicle—for everything from flat wall paints to gloss enamels. One important reason for its widespread acceptance is the outstanding durability and color retention which this Glycerine-derived resin imparts to paints.



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DISTRIBUTION

Sales Offices: The Union Bay State Chemical Co., Inc. (Cambridge Mass.) has cut the tape for its new development laboratory, warehouse, and sales office in Greenville, S. C.

- Reilly Tar & Chemical Corp. has opened a new sales office in Houston, Tex.

- Acheson Colloids Co. (Port Huron, Mich.) has established two new sales offices: one in Rochester, N.Y., to serve western New York and western Pennsylvania; the other in Dallas, to cover the Southwest.

- Bigelow Fiber Glass Products has opened a sales-technical service office in Detroit. Served by the office: Ohio, Indiana, Illinois, Michigan, Wisconsin and Minnesota.

- Godfrey L. Cabot, Inc., has started up a new Chicago sales office to handle accounts in Illinois, Minnesota and Wisconsin.

- Detrex Corp. has opened a regional sales office in Meriden, Conn., to cover the New England states.

- Wyeth Laboratories is building a new combined office and warehouse at Secaucus, N.J., for its New York,

New Jersey and Connecticut territory.

- Ace Glass, Inc., producer of laboratory glassware, is placing a new warehouse and office building at Louisville, Ky.

- Merck & Co., Chemical Div., has opened a regional sales office at Atlanta, Ga. The area served includes Alabama, Florida, North Carolina, South Carolina, Tennessee, and parts of Kentucky and Louisiana.

New Offerings: Nest - A - Bin (CW, March 20, p. 64), a large aluminum nestable bin, which can be "knocked down" for return shipment, now sports an improved design. Willy's Motors, Inc., which recently acquired the Nest-A-Bin firm, redesigned the containers for shipping chemicals, pastes and powders. One change: capacity has been upped 10% on some models without decreasing the number fitting into a freight car or trailer truck.

- Butyl acrylate and 2-ethylhexyl acrylate are now being offered by Carbide and Carbon Chemical Co. in multiple drum quantities.

- Small, 0.1 millicurie quantities of



Staff for a Seaway

OATHS OF OFFICE just taken, the executive staff of the St. Lawrence Seaway Development Corp. pose for photographers as they huddle over the first of their many problems. In the background is a chart of the epoch-making project. Shown above are (l. to r., seated) M. W. Oetershagen, deputy admin-

istrator; L. G. Castle, administrator; and H. Moore, advisory board member. Standing: J. C. Beukema, K. M. Lloyd, and E. J. Noble, all members of the advisory board. Not in picture: board member H. C. Brockel. Their task: to plan and supervise the six-year, \$105-million undertaking (CW, May 22, p. 74).

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Rubber Industry

Stauffer has been supplying chemicals to the rubber industry, since the early days of vulcanization. With an expected production of over 1500 thousand long tons for the next year, this industry depends on Stauffer for the heavy chemicals important to rubber processing and manufacturing. Stauffer has Carbon Disulphide, for cold vulcanization and manufacture of rubber

accelerators, Sulphurs and Crystex Insoluble Sulphur, for all types of vulcanizing, Caustic Soda, Chlorine, Sulphur Chlorides, and Acids.

For processing chemicals, Stauffer assures its users of continuous supplies.

Since 1885 Stauffer has been furnishing industry with dependable products and service.

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Potassium Nitrate
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Sodium Silico Fluoride*
Sodium Sulphate*
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for all uses
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This new improved form of Copper Sulphate Crystals designated as Industrial Crystals Copper Sulphate is uniform in structure and free-flowing and is readily adaptable to all types of solution equipment.

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DISTRIBUTION . . .

radioactive carbon - 14 - tagged chemicals are being distributed by Bio-Rad Laboratories, Berkeley, Calif. Among those available: sodium carbonate, sodium bicarbonate, sodium acetate, glycine.

- Magnesia and calcium silicate in 85% strength have now joined the line of chemicals in the Baldwin-Hill Co.'s (Trenton, N.J.) warehouses.

- Lithocote Corp. (Chicago) now has facilities for the protective-coating lining of tank cars.

- Natural rubber sheet linings for protective surfacing operations have been added to the stock of Atlas Mineral Products Co. (Mertztown, Pa.).

- Adipyl chloride in research and pilot-plant volumes is obtainable now from Spatz Chemicals, Inc. (Sioux City, Iowa).

- Ammonium thiocyanate in crystalline form is under production by the Halby Chemical Co. (Wilmington, Del.). For the past eight years, the firm has sold only aqueous solutions of the chemical.



Off with a Roar

MONSANTO'S plastics marketing head, Richard Carl Evans, hears a "lion's" reactions to the announcement of the firm's sponsorship of the CBS-TV "Morning Show." The news was broken at a customers' breakfast in Atlantic City, N.J., during the recent Housewares Exhibition there. Monsanto plans to plug—with 62 participations this year—its line of plastic housewares, tile, toys and vinyl film. Frolicking about the breakfast: an animated conception of the show's star lion puppet, "Charlemagne."



Cyanamid announces an outstanding **ANTI-STATIC AGENT** **CATIONIC SP***

Small amounts of Cationic SP will effectively control static charge accumulation on a wide variety of materials such as textiles, plastics, paper, waxes and polishes.

It can be applied externally to textile fabrics by brush, pad or spray of dilute aqueous solution, or incorporated into the rinse water after washing. Inclusion of Cationic SP in textile lubricants, such as coning oils, helps keep fibers static free during processing.

Permanent static control of plastics is accomplished by adding Cationic SP to the resin before molding, or including it in the emulsion or slurry polymerization recipe. Waxes and polishes with Cationic SP incorporated into the paste or emulsion remain static free after rubbing or buffing.

Other potential applications of Cationic SP include its use as . . .

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- Rewetting Agent, especially for resin-impregnated papers
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- Mold Lubricant for plastics and resins
- Solubilizing Agent for phenols, cresols, pine oils, etc.

Samples and technical data are available on a 35% solution of Cationic SP in an isopropanol-water mixture. A more concentrated material will be offered in the future.

*(stearamidopropyldimethyl-β-hydroxyethylammonium phosphate)

SAMPLE AND TECHNICAL DATA

American Cyanamid Company
New Product Development Department, Section B
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Gentlemen:

Please send me:

- ☐ Literature on Cationic SP
☐ Research sample of Cationic SP

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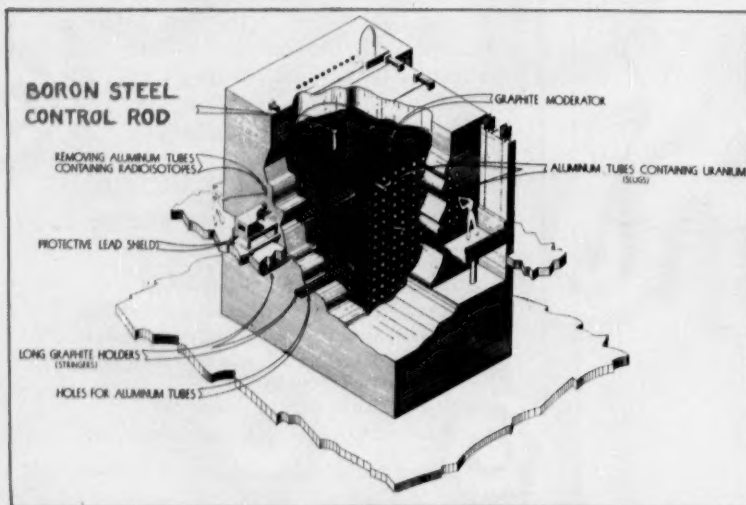

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RESEARCH

From Mule Power . . .



. . . To Atomic Power



Better than any number of words do these pictures tell the story of boron's metamorphosis from the symbol of a prosaic commodity to a highly prolific head of a burgeoning family of specialized chemicals. Typifying this drastic change is the use of elemental boron in atomic energy. As shown in the cutaway illustration above, the neutron-absorbing element is one candidate for reactor control rods—the devices, which brake the chain reaction, prevent it from getting out of hand. It's just one case of . . .

Boron's New Bid for Jobs

About as outmoded as the 20-mule team is the notion that borax, boric acid and a handful of oxides comprise the measure of commercially significant boron chemicals. The truth is that a plethora of new boron compounds, as well as the element itself, are bidding for a profusion of gainful jobs.

Among the hopeful newcomers are

candidates for such divergent applications as refractories and rocket fuels, flame retardants and weed killers, catalysts and nuclear reactor control rods. They're the result of mounting boron research activity that cuts across industry and government lines.

Aside from the products it is spawning, the upsurge is evidenced by such recent moves as the doubling of Pacific

Coast Borax's research staff, the retention as consultants of authorities like Alfred Kroll* (by Pacific Coast Borax) and Anton Burg (American Potash & Chemical). The latter's recently published (*CW*, Feb. 6, p. 50) fundamental boron polymer studies are the cynosure of brisk industrial interest.

The mounting tide of research activity is channeling off into three broad fields of study: elemental boron; boron organics; and inorganics.

Elemental Progress: Of these, the first offers what is perhaps the greatest potential for growth. Elemental boron has electrical properties that should be useful in a number of ways. Its exceptionally high specific resistance at room temperature, for example, has the unique characteristic of dropping sharply with increasing temperature.

The element, moreover, is extremely hard, a powerful deoxidizer and shows a strong affinity for several gases. Couple this last attribute with a marked degree of insolubility in copper, and you have an almost ideal scavenger for ridding that metal of occluded gases.

The Atomic Energy Commission is vitally interested in boron for reasons that are mostly security-shrouded. But one of the element's recorded nuclear talents is its superior ability to absorb neutrons. This accounts for trials of boron-containing shields and control bars for atomic reactors.

Nonatomic military applications hinge on the use of a boron-oxidant mixture in delayed action fuses, and refractory boron in high-temperature jet aircraft components.

One whopping big possibility for elemental boron is in steel-making, where, it is believed, a pure ferroboron should produce vastly better results than the boron alloys (made with oxides) now in use. It's possible, say steelmakers, that boron steel output might hit 2 million tons in the near future—a goal that would call for about 200,000 lbs. of boron.

These growth prospects are the object of keen scrutiny by the sprinkling of boron producers. Of these, Cooper Metallurgical Associates (Cleveland), American Potash (Los Angeles), F. W. Berk & Co. (New York) and Norton Co. (Worcester, Mass.) are just about the whole story.

Many Routes, Many Grades: Cooper makes the substance by electrolysis of a fused bath of potassium chloride (or fluoride), potassium fluoride and boron oxide, obtains a 99%-pure product. Utilizing an externally

* Developer of the titanium manufacturing process that bears his name.

159



SO many *good* things are made of plastics today. From the time you comb your hair in the morning until you snap off your television set at night, the magic realm of plastics is at your service. There's hardly another material as strong, light, durable or as easily processed into eye-appealing forms as the products of this giant young industry, which has doubled its growth every five years since 1930.

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Pittsburgh PX Plasticizers—and all other products of our ten integrated divisions—are quality-controlled from coal to final processing: better products for industry and agriculture . . . because Pittsburgh is basic.



1990-9399



CONSULTANT BURG: In a fundamental discovery, more than academic interest.

heated graphite crucible and an iron cathode, the process is just one of several possibilities† for production of the element.

Cooper's product goes for \$1/g. (better than 99% pure); 70¢/g. for more than 500-g. lots. Berk, through Berkshire Chemical Co. (New York), sells amorphous boron of 85-87% purity for \$13-15/lb., while American Potash is offering pilot-plant quantities of 90%-pure boron for \$20-25/lb. Pacific Coast Borax, still on the outside looking in, is considering an elemental boron production unit, will probably have good use for the metallurgical talents of consultant Kroll.

Other sources of the element are Fairmount Chemical and A. D. Mackay (both of New York), which supply both amorphous and crystalline grades.

A new development is the revelation of a recent AEC patent (2,685,501) describing a process of preparing boron by the reduction of a boron halide with alkali metal. The technique comprises forming a fine dispersion of molten alkali metal in a gaseous medium and reacting this with the boron halide at an elevated temperature.

Organics Set Pace . . . In the organics field, borate esters have a corner on the news. A flock of novel borate esters, recently introduced by American Potash and Pacific Coast Borax, are now scurrying for jobs in a wide range of industries.

Among use prospects pointed up by both companies: dehydrating agents, synthesis intermediates, special solvents, sources of boron for catalysts, plasticizers and adhesion additives for

latex paint, fire retardants in plastics and protective coatings, ingredients of soldering and brazing fluxes.

The borates in question include trimethyl, tri-*n*-butyl, tri-*n*-amyl, tri-*n*-hexyl, tri-*n*-octyl, tri-*n*-dodecyl, tri-*o*-cresyl, tri-(2-cyclohexylcyclohexyl), and trihexylene glycol diborate. All of the foregoing are available from Pacific Coast Borax. American Potash's series, launched earlier, include such additional members as the tricyclohexyl, tri(methylamyl), tri(tetrahydrofurfuryl), tri-*m*-cresyl, tri-*p*-cresyl and tri(tetradecyl) borates. Still research items, they range in cost from \$2.25 to \$5/lb.

. . . But Inorganics Move Too: Shaded to some extent by their brand-new organic cousins are the older and more familiar inorganic borates. But research in this area hasn't exactly dragged its feet. American Potash, for example, is pushing a new 57% boric oxide (tradenamed Borotherm) as a washable fire-resistant additive to polyvinyl acetate paints. Complex borophosphates (produced by Quaker Chemical, Glyco Products) must be credited with pioneering boron flameproofers in the textile industry, but—unlike the new oxide paint preparation—they lack washfastness.

Another newcomer, high-purity (99%) boric oxide (anhydrous boric acid) is finding outlets in the manufacture of ferro alloys, abrasive boron carbide, metallic borides for tools and dies, and various organic and inorganic boron chemicals.

Somewhat afire, sodium borohydride—recently introduced by Metal Hydrides (Beverly, Mass.)—is gaining impetus as a reducing agent in such biochemical work as hormone manu-

facture. Applicable to aqueous media, it is filling a long-standing need in chemical synthesis. Potassium borohydride should be the next member of the family to bow in, if Metal Hydrides' plans materialize. Expected to cost less than the sodium derivative, it could open a new territory as a foaming agent for rubber latices.

Other boron hydrides are known to be of prime interest to the defense research program.

Once-removed from hydrides, boron nitrides are not escaping surveillance by researchers in several quarters. Launched by Norton Co. (Worcester, Mass.), the material is handicapped by high cost. At the outset, boron nitride was sold by Norton, Fairmount, Cooper Metallurgical, Molybdenum Corp. of America (New York) and Johnson and Scudder for prices ranging from \$40 to \$250/lb., depending on purity. Today it still goes for \$46/lb. (more than 50-lb. lots) as a high-purity product of Norton.

Coatings, Electronic Uses: Potential uses as refractory coatings, etc., hinge on the material's nonconductance, low bulk density, and high temperature resistance (it melts in the vicinity of 3,000 C).

At Battelle Memorial Institute (Columbus, O.), methods to utilize the extremely hard and temperature resistant boron compounds as protective coatings are being sought. Boron, boron carbide and boron nitride can usually be formed in place. And, depending upon the base material, borides of silicon, zirconium, vanadium and tungsten can be formed as protective coatings.

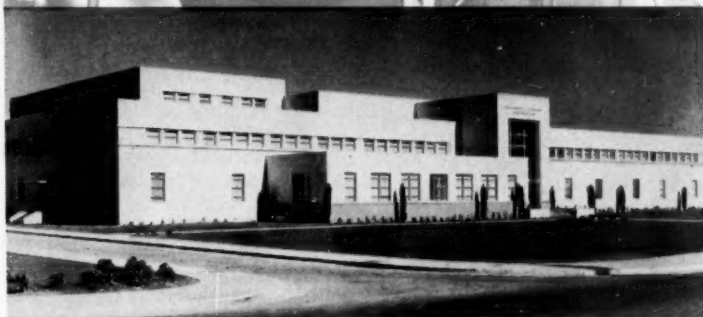
The big problem is to reduce boride coatings' brittleness and tendency to crack. This goal becomes doubly important in view of the potential ability of these substances to fill in for tungsten carbide should the latter become unavailable as a result of war.

Borides also are worthy of note for their possible value in electronics. Lanthanum boride was found to be a particularly good electron emitter by General Electric researchers, is currently undergoing further study along with several other metallic borides. Most of these compounds (e.g., barium, calcium, cobalt, chromium, iron, lanthanum, molybdenum, manganese, tantalum, titanium, vanadium, zirconium borides), produced in one place or another, are available from A. D. Mackay (New York).

Not all boron chemicals research is aiming for new worlds to conquer. Stauffer Chemical Co. (New York), for one, is concentrating its research on new and improved grades of borax.

† Another: the breakdown of boron chloride by a high-tension arc.

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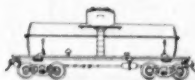
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Stauffer is also represented in boron chemicals by boron trichloride, useful as a catalyst in silicone production and as an extinguishing agent for magnesium fires.

High-Temperature Polymers: Industry, however, has no monopoly on significant new boron research developments. One of the most interesting and potentially rewarding advances in boron chemistry was recently forged in the laboratory of University of Southern California Professor Anton Burg. Crux of Burg's achievement (*CW*, Feb. 6, p. 50) is a series of inorganic boron-phosphorus and boron-arsenic polymers that stand up to temperatures approaching 700 F.

Never demonstrated before, Burg's boron-arsenic and boron-phosphorus compounds are creating a stir among industrial people who are tantalized by the possibility of achieving useful polymeric substances with a heretofore unattainable range of physical properties.

Before their hopes can be realized, however, they must overcome the problem of poor stability in high polymers of this type. Also needed: a way to eliminate malodorous intermediates; some, according to reports, are about as offensive as is possible.

Now an American Potash consult-

ant, Burg is continuing his boron studies, recently published his work on sulfur-boron polymers. Despite the flurry they have created, there's no guarantee that Burg's discoveries will ever come to anything commercially.

In like fashion, boron antiknock additives created a flurry of excitement three years ago when Standard Oil Co. of Ohio showed that boron compounds in leaded gasoline cut the octane-nullifying effect of engine deposits. With the advent of tricresyl phosphate, however, boron enthusiasm has chilled sharply.

Room to Grow: At this point, it's nearly impossible to predict the probable impact of the aforementioned research on the boron chemicals business. At best, it's going to take considerable time to convert promising lab data into new sales.

And even if the fondest hopes of boron researchers materialize, there's still little chance that the battalion of resulting new uses can create a raw materials shortage problem. America's Mojave Desert boron deposits have proved adequate for over 90% of the world's boron needs. It's highly doubtful that boron chemicals producers will exhaust the reservoir—but on the strength of their current research effort, it looks as if they may try.

Fire Blight Snuffer

Spread by insects, and the elements, fire blight has ravaged fruit trees for more than a century. But relief from this disease is in sight as the result of recent U.S. Dept. of Agriculture experiments with a Terramycin-Streptomycin mixture developed by Chas. Pfizer & Co.

Pfizer has launched the Terramycin-Streptomycin combination under the tradename, Agri-mycin.

In recent tests, 600 Bartlett pear trees were set aside in a 400-acre section of the Di Giorgio Orchards (Marysville, Calif.). Half were sprayed with the antibiotic mixture, the other half with only a water spray. In the untreated section of the test plot, 268 cases of fire blight infection developed; only five infections cropped up in the treated portion.

Test findings were reported last week to the American Phytopathological Society by John C. Dunegan, principal plant pathologist of the USDA. According to Dunegan, it was the first successful large-scale commercial trial with antibiotics—one that could mark the end of fire blight losses, estimated at \$70 million annually.

Some Added Benefits: Skin russetting of pears, caused by attempts to check fire blight with traditionally used copper sprays, did not occur on antibiotic-treated fruit. Russeted pears are unfit as fresh fruit, usually are sold to canneries at low prices.

Heartened by news of the blow dealt the orchard disease, farmers are clamoring for antibiotic control measures for other still-incurable plant scourges. Crop damage from such plagues costs growers hundreds of millions of dollars each year. And the reason for guarded optimism stems further from the fact that such ailments as bacterial spot of tomatoes and peppers, halo blight of beans, walnut blight, black leg and soft rot of potatoes have already yielded to antibiotics in field trials.

Evaluation of Terramycin and Streptomycin for fire blight control has spanned three years, occupied industrial, federal, state and university research men. Prominent in the work: researchers of Chas. Pfizer & Co., H. F. Winter, H. C. Young (Ohio State Experiment Station), P. A. Ark (University of California), and R. S. Kirby (Pennsylvania State University).

Dunegan's assistants in the experimental work leading to the cheerful results with fire blight were Jess Kienholz, R. A. Wilson and W. T. Morris, all from the USDA experiment station at Beltsville, Md.

The Unknown Quantity

Classified research by government agencies is the one piece conspicuous by its absence from the boron research jig-saw pattern. Although some government-developed data, such as the new elemental boron process and the investigation of boron reactor components (pp. 62, 64), are free to all comers, most of this information is clamped tightly under the security lid.

Some of the story, however, can be told.

Atomic Energy is perhaps the principal, and most closely guarded, avenue of study. An excellent neutron absorber and far less dense than lead, boron has been eyed for a variety of radiation shielding jobs in which high weight is undesirable. Another line of study has dealt with the use of the element in neutron thermometers.

In the military aircraft research program, boron coatings that resist thousands of Centigrade degrees of heat are being eyed with keen interest as possible answers to several rugged heat and corrosion problems of jet aircraft.

Propellant chemists, on the other hand, have fine-combed the vast expanse of known boron compounds, found diborane, pentaborane and aluminum borohydride worth a closer look as potential rocket fuels.

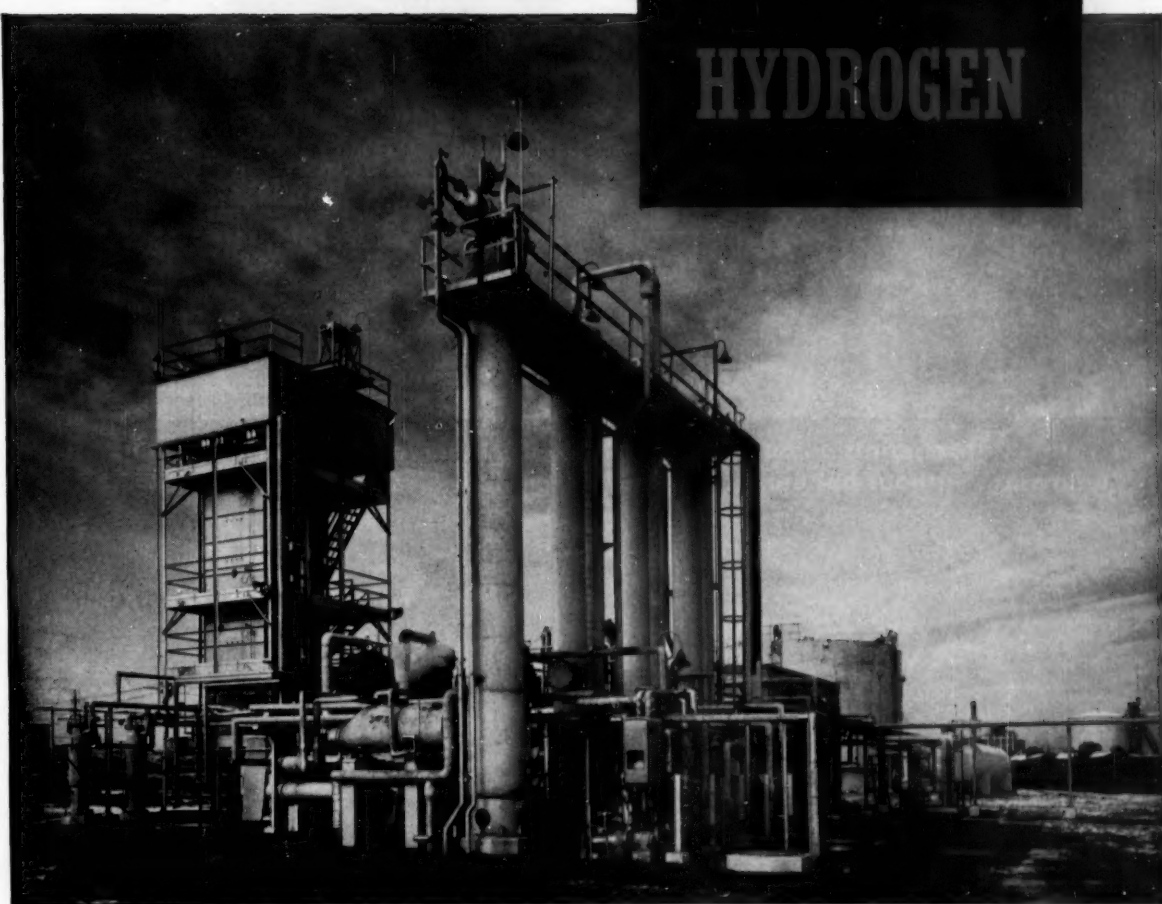
Of more general military interest are such attributes as:

- Boron's value as an alloying agent. It contributes hardness and heat resistance to a variety of metals. Where aluminum is concerned, boron exhibits the remarkable faculty of improving strength without impairing electrical conductivity.

- Its electrical characteristics, which at once suit it to such uses as resistor, thermoelectric couple and semiconductor component.

Details of any of this work are, of course, unavailable. And until more can be told, there will be a gaping hole in the boron picture. The omission, moreover, has more than academic significance. New applications spawned by government researchers may well have the capability of breeding worthwhile new business.

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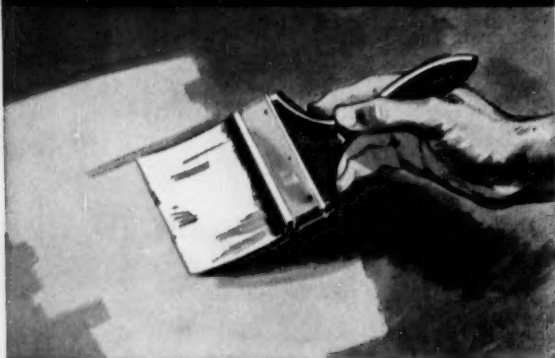
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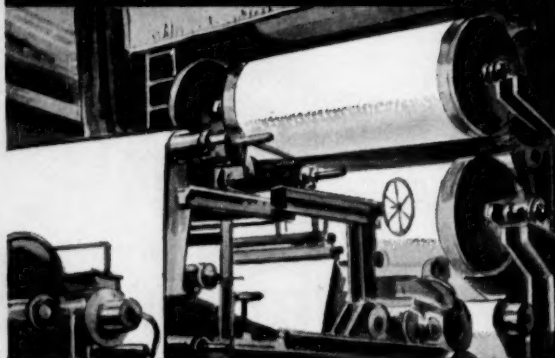
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Nopco foam killers are used profitably today in the industries mentioned above, in others, too, including the manufacture of beet sugar and glue, and many fermentation processes.

Perhaps a Nopco defoamer—or some other Nopco chemical—might remove a rough spot in *your* production. Why not tell us the ends you wish to achieve? We'll work closely with you... try our best to help you gain substantial results, as we have done for others.

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RESEARCH

Double Bid

A new antibiotic out of Lederle Laboratories is approaching the threshold of clinical evaluation. Its potential targets: cancer and sleeping sickness.

Puromycin by name, the new material is whipping up a storm of interest among medical and chemical men.

The former were apprised of its promising range of activity at the recent Sixth International Cancer Congress in Sao Paulo, Brazil. There, Lederle's John Oleson had his medical audience on the edge of their seats with the report that Puromycin had abolished 75% of transplanted mouse breast cancers with no recurrences during a year-long test period.

Two other revelations also are significant to cancer probers: the antibiotic appears to have little effect on other types of mouse cancer; its activity seems to be accelerated by the synthetic drug thiotriethylene phosphoramide.

Specificity of the compound may be the clue to how it exerts its beneficial influence. As a matter of fact, one current body of opinion leans to the view that one special fragment of the molecule is responsible for its singular activity. Any attempt to deduce the part in question, however, is inviting a headache; structurally, the compound is 6-dimethyl-amino-9-(3'-p-methoxy-L-phenylalaninylamino-D-ribose)-purine.

Its purine component gives the new antibiotic common ground with other known anticancer agents (e.g., 6-mercaptopurine) and the beginning of a name that is completed by attaching the characteristic *mycin*. The latter is taken from the name of the mould, *Streptomyces alboniger*, that yields the antibiotic.

Rounding out Puromycin's field of known activity is its ability to combat the sleeping sickness trypanosome. Here, too, it is taking on a disease that has consistently resisted chemotherapeutic control. The potential reward—opening large areas of the African continent—is ample incentive for further development.

And it's going to take a lot more work before the promising antibiotic is fully characterized. Right now it's still the ward of Lederle's chemotherapeutic research dept., in whose laboratories it was isolated in Aug. '52. Clinical studies now getting under way will provide much of the data that will decide the material's future.

More Growth: Still coming thick and fast is expansion news. This week



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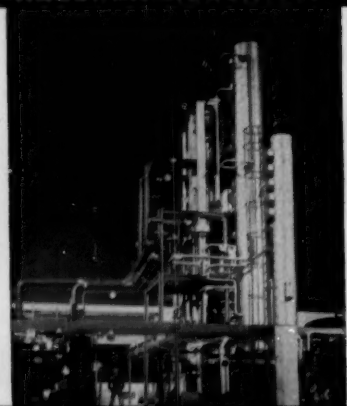
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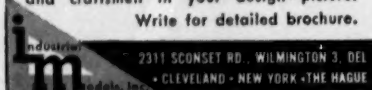
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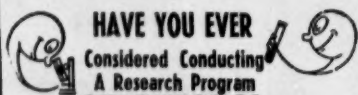
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RESEARCH

three developments spell new research growth at as many companies:

• Plans for the expenditure of \$250,000 to bolster molybdenum research were revealed by Climax Molybdenum Co., New York (*CW Newsletter*, Aug. 28). The firm will use the money to commission about 8,000 sq. ft. of research space in a newly acquired building adjacent to its Detroit laboratories. Due for bolstering are studies of new molybdenum chemicals, molybdenum-based lubricants, catalysts and alloys.

• New Dow agricultural research facilities are rapidly nearing completion at Freeport, Tex. Comprising three buildings (two poultry labs and a greenhouse), the construction is the nucleus of proposed new headquarters for the company's entire agricultural research department. Scheduled for occupancy this month, the new quarters will shortly be swinging into motion on the evaluation of synthetic amino acid poultry feed supplements, among other assignments.

• A new \$2.55-million laboratory building is Du Pont's contribution. Still on blueprints, the new structure will, when completed, shelter the long-range projects of the company's electrochemicals and pigments departments. Site preparation for the new structure has begun at the Du Pont experimental station (Wilmington, Del.). Ultimately it should assume part of the work now carried on in Newark, N.J., and Niagara Falls, N.Y., labs.

Salt Switch: A potential competitor for potassium iodide as a salt additive has loomed up from recent investigations at Armour Research Foundation of Illinois Institute of Technology (Chicago). It's cuprous iodide, appears particularly promising as a goiter-preventing agent in livestock salt licks. Considerably less soluble in water than potassium iodide, the copper salt does not leach out as readily. It's also more stable, might eventually win a place in common table salt. Morton Salt Co. sponsors the Armour research in this field.

Extra Dry: The Matheson Co. (East Rutherford, N.J.) has taken a notable step toward the elimination of a time-honored but troublesome laboratory necessity—the drying of cylinder hydrogen before each use of the gas. Matheson is offering a new, extra-dry hydrogen (of 99.9 mol.% purity) containing less than 0.014 mg. of moisture per liter. Moisture, a heavy contaminant of regular commercial electrolytic hydrogen, is anathema to

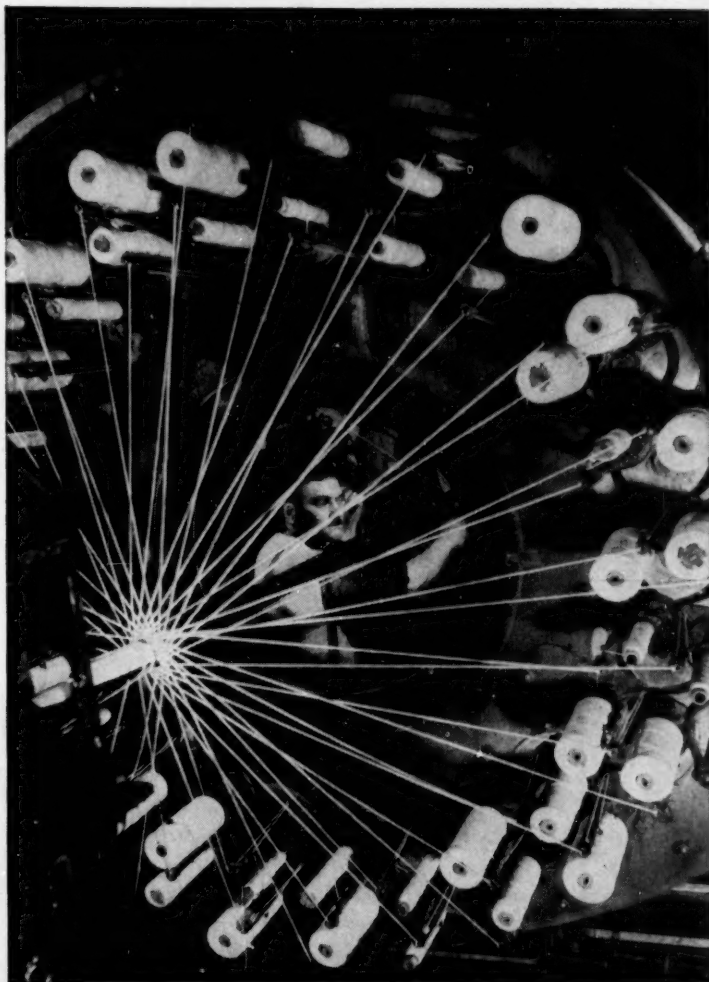
exacting synthesis and analysis work.

• **Virus Bane:** What may be one of the most significant veterinary chemotherapeutic advances in recent years is reported by Ricino Chemicals (New York). Last week the company unveiled a new drug claimed to be highly effective against canine distemper. The brainchild of Ricino research director Walter Winckler, the healing agent is sodium sulforicin hydrazine. It reportedly has cured more than 200 animals stricken with the "incurable" virus disease.

• **Neutron Monitor:** New from Nuclear Instrument and Chemical Corp. (Chicago) is its model 2715 Nemo battery-operated survey meter for neutron measurement. Developed for personnel protection around atomic accelerators and reactors, the unit indicates proper operation as well as low counting rates by means of a pair of neon lamps, which are alternately lit with each detected neutron. Earphones provide for audible monitoring. Heart of the instrument is a pair of enriched boron trifluoride neutron detectors. One is used by itself for the detection of thermal neutrons. The other is surrounded by a block of paraffin and a cadmium shield, is sensitive only to neutrons with energies above approximately one electron-volt.

• **Lab Progress:** Procter & Gamble Co. (Cincinnati) has completed its new Buckeye Laboratories in Memphis and has undertaken expansions at both the Miami Valley Laboratories and at its manufacturing administration and research building in Ivorydale, O., just outside of Cincinnati. Research space will be increased more than 35% by the new construction. To strengthen its research hand further, P&G has created a new vice-presidency in research and development.

• **Enzyme First:** Uridine monophosphate, a coenzyme vital to the normal growth of body cells, was synthesized for the first time last week in the laboratories of British Columbia Research Council. Credit for the precedent-shattering achievement belongs to 32-year-old Indian researcher H. Gobind-Khorana who has opened the door to abundance of an important biochemical research weapon. Usually obtained from animal tissue extracts, the enzyme now costs about \$90,000/lb. When synthetic production gets under way, cost should plummet. The enzyme is playing an important role in cancer studies.



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as shipped 4-4.5 lbs./cu. ft.

centrifuged in toluol 7.5 lbs./cu. ft.

true (specific gravity) 2.1-2.2

pH 7.2

Silica as SiO_2 (dry basis) 99.5%

Oil adsorption 240 lbs. oil/100 lbs. SiO_2

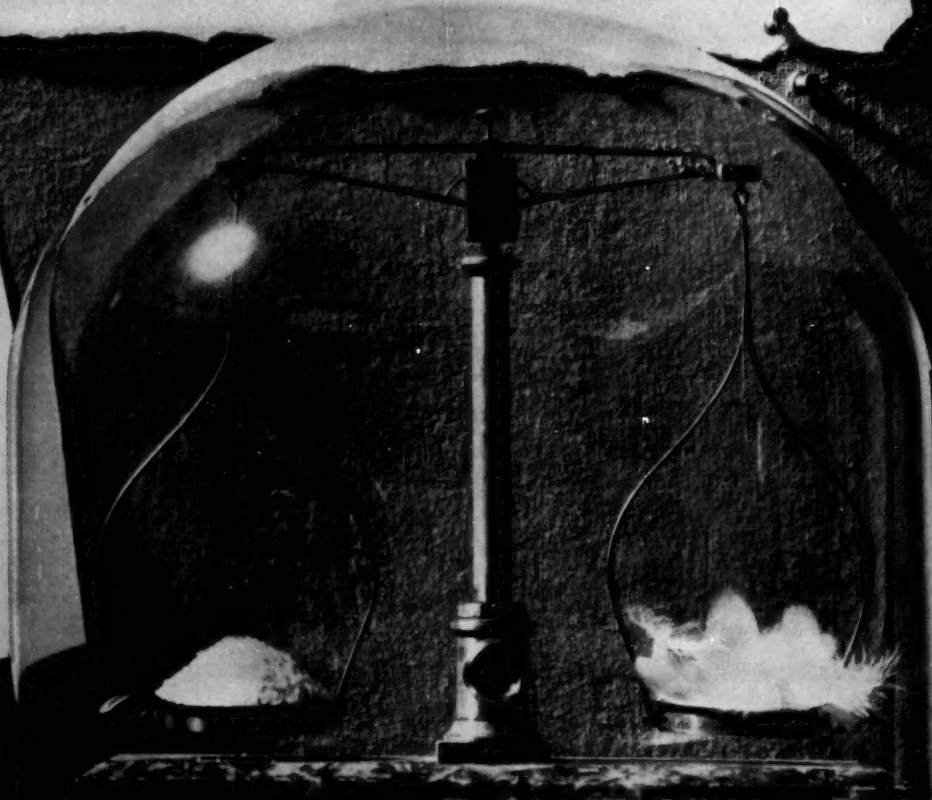
Surface area (nitrogen) 292 M_2/gram

PARTICLE SIZE DISTRIBUTION BY WEIGHT

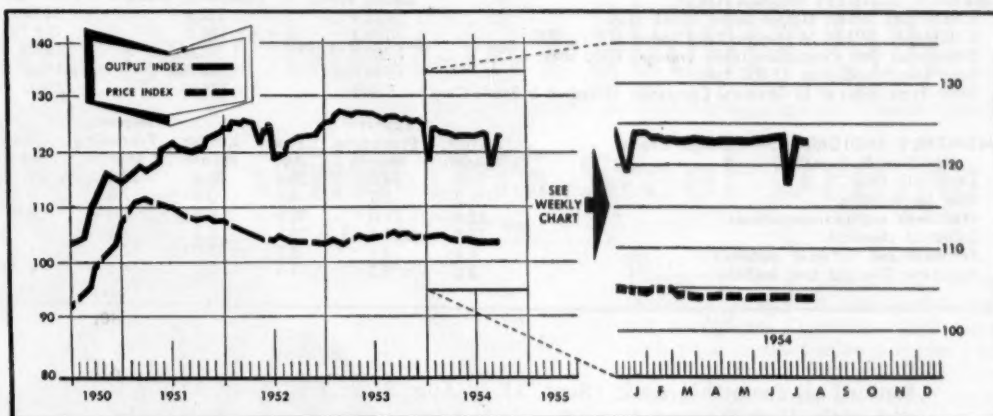
(water sedimentation)	
5% less than 1.1 microns	
10	1.4
20	2.0
40	3.0
50	3.7
60	4.5
80	7.0

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MARKETS



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Some dejection is prevalent in plasticizers: witness last week's sudden recrudescence of the mid-spring (CW Market Letter, April 17) competitive pricing moves. Ohio-Apex, bumping into persistent sub-market quotes, boldly reduced its dioctyl phthalate (DOP) and diisooctyl phthalate (DIOP) prices by $1\frac{1}{2}\phi$ /lb.

This move—despite the long-time mixed-up market condition—caught most of the major plasticizer producers with their price lists unchanged. But in a few days, practically all customers will be offered similar inducements to buy; the new schedules— $30\frac{1}{2}\phi$ /lb. for both DOP and DIOP (in tanks)—will prevail throughout the industry.

It's almost foregone, too—though not yet generally announced—that dicapryl phthalate users will be paying a lower price— $29\frac{1}{2}\phi$ /lb.

There was a quick confirmation of last week's indication that lead prices would be boosted (CW Market Letter, Aug. 28). The new $14\frac{1}{4}\phi$ /lb. price almost immediately hoisted with it a few prime paint materials. Dry red lead is now posted at $16\frac{3}{4}\phi$, litharge at $15\frac{3}{4}\phi$, both in c.l. quantities. Meanwhile, orange mineral is sporting a split l.c.l. tag—some producers selling at 19.85ϕ /lb., others slightly lower at 19.60ϕ .

With the government deciding to stockpile at least 200,000 tons of lead, some market followers are convinced that the current $\frac{1}{4}\phi$ rise will not be the last.

There's more attention being paid to plastics' role in home construction. In addition to the two-day "Plastics in Building" conference to be held in Washington, D. C. the end of next month (CW, Aug. 21, p. 91), Massachusetts Institute of Technology—sparked by a Monsanto grant-in-aid—will scout plastics' market potentials in various phases of home building.

The year-long exploration will eye such diverse outlets as foundations, floors, windows, doors, service equipment and furnishings.

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MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	122.9	122.9	126.2
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.2	104.2	104.7
Bituminous Coal Production (daily average, 1,000 tons)	1,260.0	1,293.0	1,595.0
Steel Ingot Production (1,000 tons)	1,544 (est.)	1,515 (act.)	2,140.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	320.9	325.9	246.0

MONTHLY INDICATORS—Foreign Trade (Million Dollars)

	Latest Month	Exports Preceding Month	Year Ago	Latest Month	Imports Preceding Month	Year Ago
Chemicals, total	90.4	86.6	70.4	20.6	22.6	26.5
Coal tar products	7.2	6.3	4.4	2.6	2.6	3.2
Medicinals and pharmaceuticals	22.1	21.0	18.9	0.7	0.6	0.6
Industrial chemicals	14.0	14.4	10.1	5.2	4.3	7.5
Fertilizer and fertilizer materials	4.4	4.1	3.7	10.0	12.2	11.9
Vegetable Oils and fats, inedible	8.6	5.2	1.4	7.0	4.8	8.2

tonseed oil from this week (Sept. 1) to Aug. 31 of next year. That's the gist of the U. S. Dept. of Agriculture's just-announced domestic sales policy.

Crude oil during the period will be sold (for domestic use) at market price, but not less than 15¢/lb. prime, Valley basis, f.o.b. tank cars or wagons at producers' mills; refined material will be peddled at market, but not less than the crude price—with appropriate adjustment, of course, for refining, location and quality.

CCC reserves the right to sell lower-grade crude and refined oil on a bid basis—at under the "floor" prices—but promises to "hold the quantities offered within limits that the industry can absorb." That will forestall any market-glutting, keep inventory stocks under control.

"Disrupting" may be an apt adjective to describe the widening polyurethane market (see p. 82). While Mobay Chemical (the Monsanto-Farbenfabriken Bayer offspring) continues to ponder plantsite possibilities, Carwin Chemical (North Haven, Conn.) is now offering semicommercial quantities of two diisocyanates.

The company has been quietly supplying ditolylene and dianisidine diisocyanate for the past few weeks, is now ready to push the items with greater vigor. The target: such specialty products as coatings, adhesives.

No extra market propulsion will be needed to move some impressive quantities of synthetic lubricants to defense outlets. A just-completed Defense Dept. evaluation of present and future requirements concludes that already-formulated jet engine production plans can use about 1.7 million gal. between now and June '57.

Compounds such as diisooctyl sebacate are among the synthetics the government is eyeing. Normal petro-lubricants don't quite fill the jet engine need—their viscosity is not constant over the broad range of operation temperatures.

No drop in the general price of nylon is justified at this time, according to Du Pont. Nylon yarn, 40 denier, 13 filament (a typical count), has been at \$2.25 since 1949.

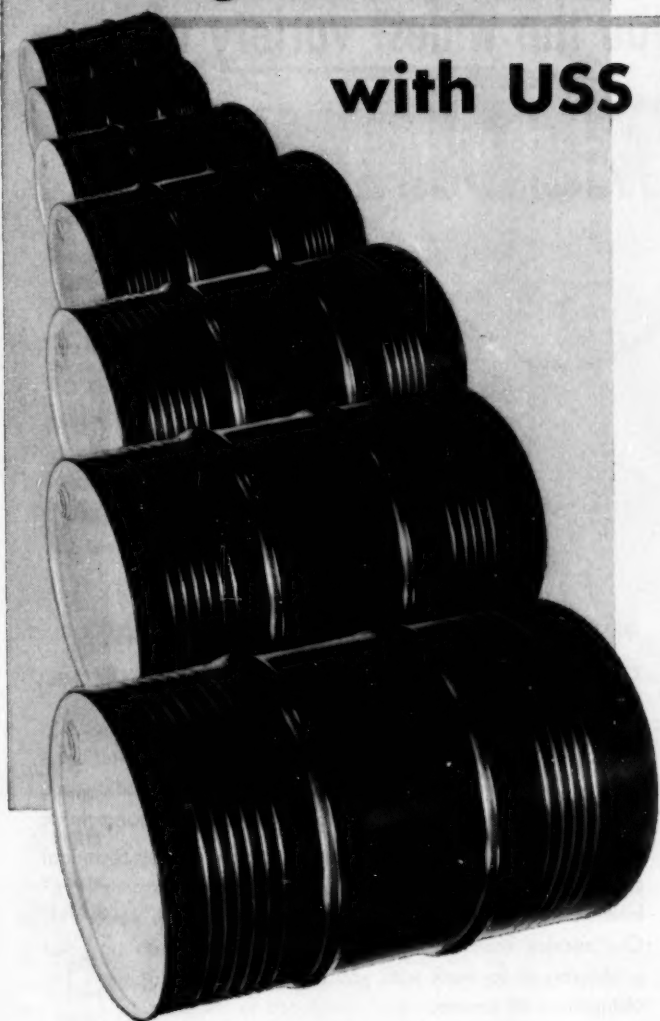
SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 30, 1954

UP

	Change	New Price		Change	New Price
Hexylene glycol, tanks, dlvd.	\$.015	\$.140	Oleostearine, bbls.	.010	.105
Mercury, metal, 76-lb. flask	2.00	295.00			

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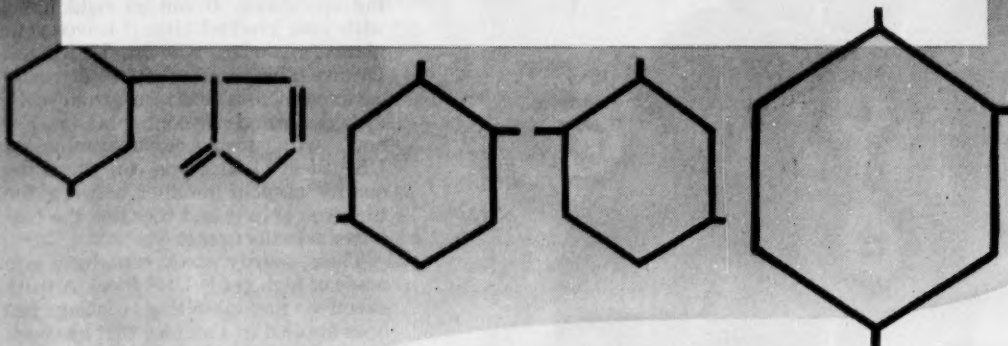
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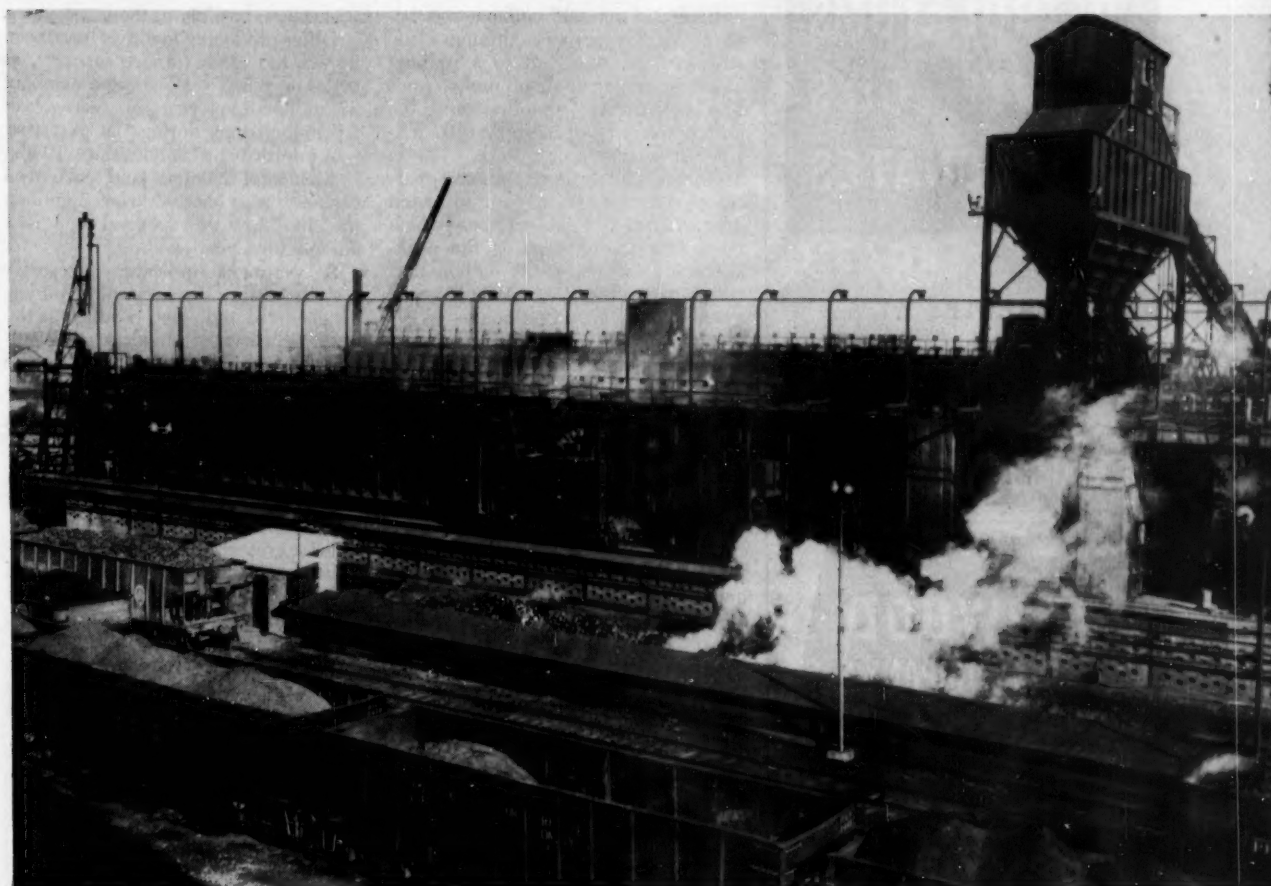
If not, it will pay you to get in touch with our technical service men. We have the facilities to produce "custom-made" intermediates and may be able to make the one you want. Our service men are always ready to help you on your problems, or to work with you in product development. No obligation, of course.

Write us on your company letterhead for additional information about intermediates and technical service available. E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes & Chemicals Division, Wilmington 98, Delaware.



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THE STEEL INDUSTRY'S by-product coke ovens, hefty chemical producers, are but one CPI tie; another, equally important, is a . . .

Steel-Strong Market

It's almost axiomatic that what happens to steel has a direct impact on just about all segments of the American economy. And the chemical industry is certainly not aloof to steel's vicissitudes. Thus, in these days of tougher selling, chemical marketers are evincing considerable interest—and some concern—about the current and future fortunes of the U.S. steel industry.

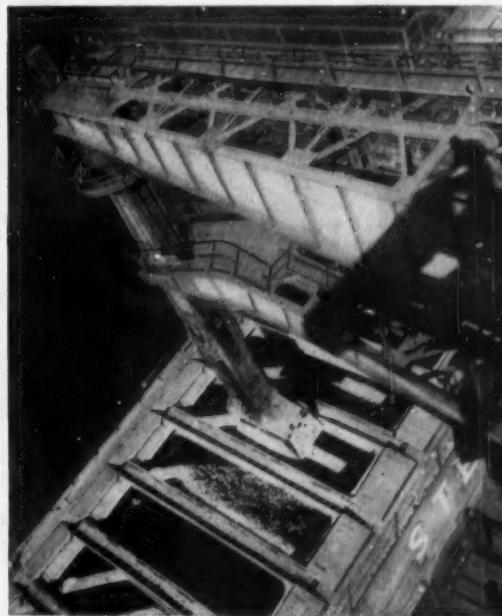
For in any list of chemical customers, steel ranks mighty close to the top. One compilation puts it among the first dozen major users, with a total expenditure for chemicals in the \$130-million/year range.

Steel, of course, is also inextricably tied to the chemical industry by reason of its hefty production of coke-oven chemicals. A dramatic underscoring of this kinship is afforded by a flashback to estimates of the amount of chemicals lost during the serious steel strikes of a couple of years ago (CW,

June 14, '52, p. 61). Weekly toll then, because of the off-again, on-again steel shutdowns, included some 12.7 million gal. of crude coal tar; 28.6 million lbs. of ammonium sulfate; nearly 3 million gal. of benzene; over 0.5 million gal. of toluene, etc.

But aside from being directly responsible for production of chemicals, steelmaking, as mentioned, is a prodigious consumer. Fact is, for some chemical sellers, steel is the biggest customer on the books. Principal chemical materials vital in the production of iron and steel are limestone, fluorspar, sulfuric, nitric, phosphoric and muriatic acids, ammonium chloride, borax, caustic—to name a few.

Hand-in-Hand Shrinking: At the moment, though, business tossed to chemical companies by steel could be, and has been, brisker. Reason is elementary: skidding production means smaller chemical markets. Steel output in the first 7 months of this year, for



LIMESTONE: Top steelmaking chemical from a Great Lakes vessel hold.

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MARKETS

example, is some 17 million tons behind 1953's January-through-July stretch. That totals out to a running monthly average of about million tons. The comparative 7-month score: 50.8 million tons in '54; more than 67 million last year.

No keen follower of the steel market expects the current year to match '53's total 111.6 million tons—which set a new record, topping the peak-Korea '51 by a near-6.5 million tons and dwarfing the World War II years' average of about 85 million.

A studied estimate for 1954, based on information from the industry's American Iron and Steel Institute, envisions output of ingots and steel for casting at a level similar to the wartime—approximately 85 million tons, or roughly about 70% of capacity.

Though consequently somewhat dimmed right now, the prospects for chemicals are nonetheless heartening. For the tremendous expansions and improvements in all facets of the steel and iron industry are a slumbering market. For instance, right now the U.S. can boast a steelmaking potential of more than 124 million tons; that's an increase in capacity of better than

32 million, or 35%, in the last 8 years.

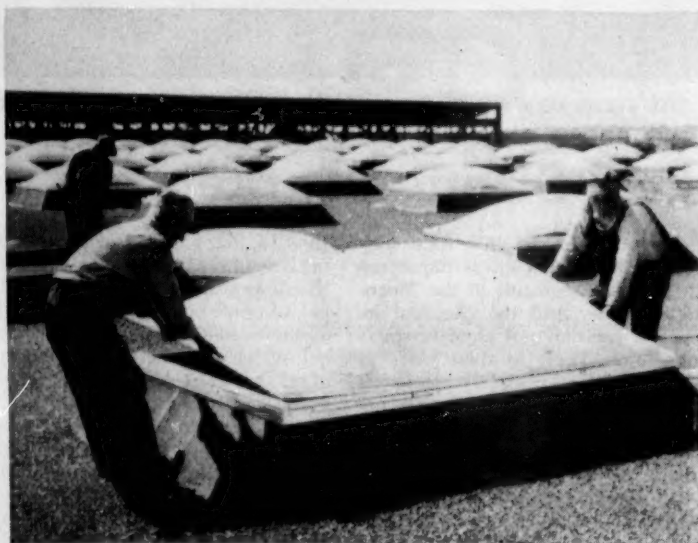
Other producing facilities have been upped, too. Blast furnace capacity, as of January this year, is rated at about 82 million tons/year, an increase of 2.6 million tons during the past year—an impressive 47% hike since 1940.

Elemental Pointer: And coke-oven capacity was boosted over 2 million tons in '53, is now pegged at a 73.2 million tons/year-level.

A pertinent indicator of steel's growth and of the widening outlets for chemical and allied products is the uptilting curve of stainless steel production (*see chart*). Last year, for the first time, stainless ingot output zipped past the million ton/year mark—a long jump from its World War I commercial introduction in kitchen knives to today's diverse market—toasters to jet engine uses.

This increasing need for stainless calls for greater quantities of corrosion-resistant elements like chromium and nickel. All such alloys contain at least 12% of the former, and some contain amounts of nickel.

Molybdenum, columbium, titanium and cobalt, too, find a ready market in stainless steels and other alloys where



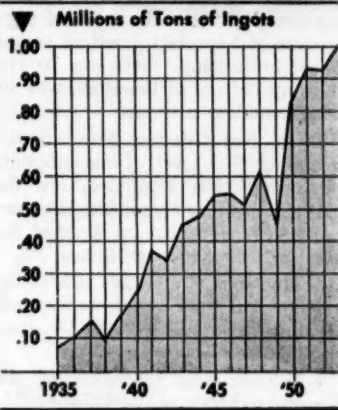
Mushrooming Consumer

THE CONTINUING trend toward use of plastics in building is clearly highlighted by this roof-top field of Plexiglas (acrylic) dome skylights being installed at the U. S. Signal Corps' Tobyhanna (Pa.) Depot.

Each dome measures 62x96 in., is formed from .312-in.-thick Plexiglas.

About 585 domes are being used at this one installation to "daylight" the structure.

Production of Stainless Steel



high strength at high temperatures is a requisite. *Steel Facts* (AISI publication) this month whips up this alloying element table of consumption for '53—a target that probably won't be hit this year:

Alloying Elements	Consumed in 1953 (thousand lbs.)
Boron	35.0
Chromium	322,134.0
Cobalt	2,546.4
Columbium	300.5
Molybdenum	22,066.7
Nickel	79,202.7
Titanium	4,877.2
Tungsten	3,380.9
Vanadium	3,227.9
Zirconium	1,816.4

The automotive industry and the building-construction trades are considered two of the top manufacturing consumers of finished stainless as well as other steel products.

Currently, construction is a fairly steady, heavy taker, despite plastics' nibbling (*CW*, Aug. 21, p. 91).

But the amount going to the auto field (normally about 20% of the total steel consumed), is off as might be expected, though the steel men hope that upcoming model changeovers will up demand.

Rooting for this, and other hikes, too, are the chemical sellers who share in the ferrous chemical profits.

Of all the chemical items used in the production of pig iron and steel, limestone is consumed in the heaviest tonnages. At the blast furnace, it—along with the coke and iron ore—constitute the "burden," or charge. Limestone is also vital in the output of basic open-

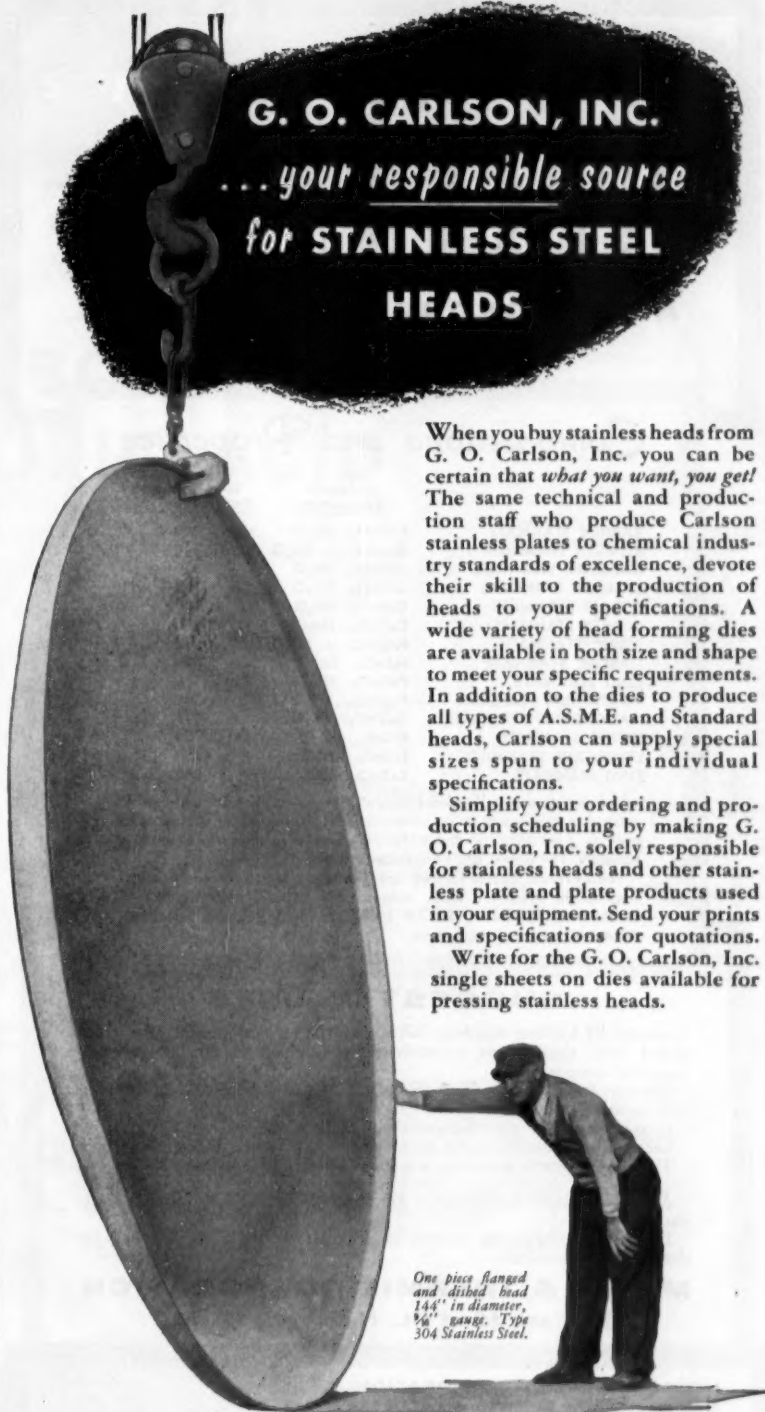
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Compositions and Properties

	Molecular Composition	Approximate Temperature of Dehydration (°C)
BARIUM STANNATE	BaSnO ₃ · 3H ₂ O	420
BISMUTH STANNATE	Bi ₂ (SnO ₃) ₃ · 5H ₂ O	140
CADMIUM STANNATE	CdSnO ₃ · 3H ₂ O	320
CALCIUM STANNATE	CaSnO ₃ · 3H ₂ O	350
COBALT STANNATE	CoSnO ₃ · 2H ₂ O	320
COPPER STANNATE	CuSnO ₃ · 3H ₂ O	280
FERRIC STANNATE	Fe ₂ (SnO ₃) ₃ · 3H ₂ O	140
FEROUS STANNATE	FeSnO ₃ · 3H ₂ O	320
LEAD STANNATE	PbSnO ₃ · 2H ₂ O	170
MAGNESIUM STANNATE	MgSnO ₃ · 3H ₂ O	340
MANGANOUS STANNATE	MnSnO ₃ · 3H ₂ O	310
NICKEL STANNATE	NiSnO ₃ · 2H ₂ O	120
STRONTIUM STANNATE	SrSnO ₃ · 3H ₂ O	350
ZINC STANNATE	ZnSnO ₃ · 4H ₂ O	280

All of the stannates listed are insoluble in water. Copper stannate is soluble in alkaline cyanide solutions. The alkaline-earth stannates as well as zinc stannate and cadmium stannate are white, crystalline powders. The others are light colored in the hydrated form.

Fired ceramic bodies formed from the stannates of barium, calcium, magnesium, strontium, lead, bismuth and cobalt can be classified as electrical insulators. Similar bodies formed from the remaining stannates are semi-conductors.

SUGGESTED USES

Stannates of barium, bismuth, calcium, strontium, magnesium, lead and nickel have applications as additives to barium titanate in ceramic capacitor compositions.

Calcium stannate is used in the production of chrome-tin maroon and pink ceramic stains.

Copper stannate is used in bronze plating baths.

Lead and bismuth stannates are employed in pyrotechnical applications. The alkaline-earth stannates are suggested for phosphor bases.

All the stannates are available for both experimental and commercial purposes.

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MARKETS

hearth steel—the process used to turn out approximately 90% of the steel made in this country. And last year, despite a decline in the average amount used* to make a ton of pig—because of improved practices among other influencing factors—a record high in total use of limestone was set at 37.9 million net tons.

More, Not Greater: Nowhere approaching that level of consumption, but nevertheless attractive, are the markets for other chemicals. Here are thumbnail run-downs on some of the more important tonnage items:

- **Fluorspar.** More than 50% of the metallurgical grade wends its way into steelmaking—a steady 300,000 ton/year market.

- **Sulfuric acid,** lifeblood of the chemical industry, is also indispensable to the basic metal industry. It's used at the rate of a million tons/year at the coke ovens operated by iron and steel companies, but nearly 750,000 tons annually goes to metal-treating uses like scale removal and pickling operations.

- **Ammonium chloride.** With about 13 lbs. of gray sal ammoniac normally consumed for each ton of galvanized sheet made, a market for about 12,000 or 13,000 tons is assured. Zinc chloride is also used as a flux—alone or in conjunction with ammonium chloride—for galvanizing, to the tune of some 4,000 tons/year.

- **Acids.** Of the acids—other than sulfuric—consumed, steel chews a 40,-000-ton/year wedge out of the phosphoric pie; hydrochloric, about 4,000 tons; nitric, some 1,500 tons.

Metallic sodium, soda ash, sodium nitrate and other sodium compounds share a 10,000 tons/year outlet, while caustic soda alone is used at a similar rate by the steelmakers.

There are many other products for which the chemical industry looks to steel as a good customer, of course; the above examples merely point up how widespread the list is.

And you can add, too, the significant quantities of nonferrous metals that drop into steel's shopping bag. The latest available tally ('53): copper, 54,000 tons; almost 17,000 tons of lead; about 286,000 tons of zinc; 37,-600 tons of tin; plus some 582,000 tons of manganese. (The latter is more than 90% of the country's total annual manganese consumption.)

No matter how you look at it, steel may well be America's underpinning industry, but metallurgical chemicals are definitely a sustaining prop.

* Averages per ton of pig iron: last year, 0.418 tons vs 0.432 in '51.

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AMERICAN COLLO'S SELIGMANN AND MORONI: Equipped with know-how and machinery from abroad, they hope to have a running start with polyurethane.



GOODRICH'S DeLONG: Not committed on latex foams, his company's "set to jump."

Polyurethane Race; Foams Away First

One of the hottest races in the chemical specialties field today centers around polyurethane foams. German-developed, they will soon be available here for specialty uses ranging from Christmas trees ornaments to life-rafts. Already test marketing polyurethane household items is General Mills' O-Cel-O Sponge Division, and bent on being first in the consumer market are the rubber companies. Both Goodyear and Goodrich are said to be close to bringing out products processed from the material. Another concern, American Collo Corp. (New York), insists it will be first.

Foreign Facts: It's easy to understand what fans the interest in the foams, the basic ingredients of which are polyesters, diisocyanates and a catalyst. Right now there are many specialties manufactured from them in Europe. For instance, they're used to:

- Make table covers, shoe insoles, shoulder pads, sponges and brushes, cleaning and washing tissues, mops, waxes.
- Pad upholstery, mattresses.
- Insulate against the cold—laminates of thin polyurethane foils go into snowsuits, overcoats, sleeping bags, gloves.
- Make soundproof walls and ceilings.
- Give buoyancy to swim suits,

life preservers, fishnets, small boats.

- Make air and fume filters.*

Generally speaking, by varying densities the foams can be turned out as soft as powder puffs, as hard as abrasives. Besides foams, the polyurethane resins can be developed into fibers, molding compounds, adhesives, elastomers, films, coatings. (CW, July 17, p. 66).

Weighed Words: According to alert O-Cel-O, the foam won't take the place of the cellulose sponge (O-Cel-O is estimated to share 90% of that market with Du Pont, which has its own ideas on the new foam as a sponge—see below). One reason given is that the foam is not particularly good at absorbing water, but says O-Cel-O, the polyurethane foam has better scrubbing properties than the cellulose type.

General Manager Jack Bitzer says \$150,000 has been earmarked for machinery to process the material into household products. While he declines to name what products he has in mind, one distributor reveals the firm will sell the foam for upholstery use and for such houseware products as mats and coasters.

To date, the company has imported

* A U. S. firm predicts the foam will be employed as a filter for cigarettes in this country. Advantage: although it removes organic tars and nicotine, it will not take up moisture as do cotton and cellulosic filters.

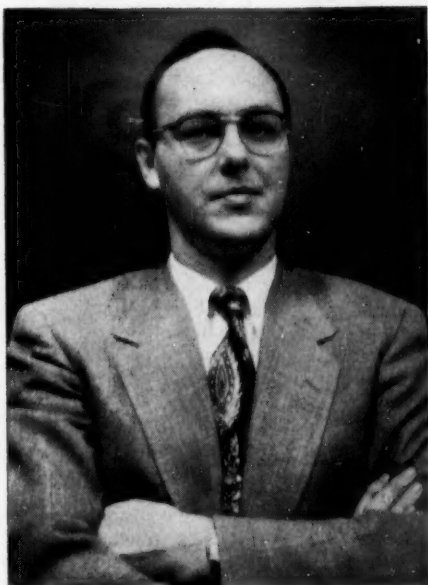
the material, the first shipment arriving in Buffalo from Germany June 26. Another similar-size shipment—valued at \$50,000—is scheduled to arrive in a week or so.

Looking for Listeners: Of the companies involved, American Collo is undoubtedly the most talkative. Formed early this year, it is an affiliate of Collo Rheincollodium, Cologne, Germany. Vice-president is Rolf Moroni, who heads the parent firm. President is Otto Seligmann. Joseph Winkler, chief chemist, has applied for U.S. patents, which he has assigned to the company.

Moroni's story is that he started working on the foam after World War II in a cowshed in Germany. Result: "Today with branch companies in (Strasbourg) and Italy (Bergamo) Collo is producing articles of extraordinary variety—bath and household sponges, bristleless brushes, hand cleansers, foams for industry and technical uses."*

American Collo expects to make similar products (based on Allfoam) in a Palisades Park, N.J., plant, which it hopes to have operating sometime next month. It asserts it will operate under a license that will be granted by Mobay Chemical Co., which was formed this spring by Monsanto and

* About 15 German firms are turning out the foam.



O-CEL-O'S BITZER: Till test marketing's finished, the investment's in imports.

Farbenfabriken Bayer, A.G., Leverkusen, Germany. Officials of American Collo are confident they have a head-start because their New Jersey plant will have German equipment and German technicians.

Action in Akron: While American Collo is busily sending out news releases, rubber companies have been less eager to publicize their positions. Here, however, is the setup:

The "big four"—Firestone, Good-

rich, Goodyear and U.S. Rubber—are more than just "interested." Each has done experimental work on the foam. Goodyear's position is especially strong because of the experience gained in developing its new polyurethane synthetic rubber, Chemigum SL.

Goodyear calls its polyurethane foam Airfoam SL, sees the foam as "a product in demand." While asserting that "Airfoam SL is applicable to the same uses as natural rubber plus many new applications," it does not see the polyurethane foam "superseding" the latex type. Goodyear is reported to have begun quoting prices on Airfoam SL for seat padding and mattresses.

But of the quartet, Goodrich is the one regarded as most likely to get going first on the foam. A possible deciding factor: unlike its competitors, Goodrich does not have any definite commitments on latex foams.

Until recently, however, there was one hitch—Goodrich lacked a foam selling force. This it acquired by its purchase last month (Aug. 13) of Sponge Rubber Products (Shelton, Conn.). Now, as one source puts it, Goodrich is "set to jump." Clyde DeLong, Goodrich's industrial products division manager, believes one of the largest problems the company faces is to evaluate the size of the market for the new foam.

Yonkers Independent: The dark horse in the picture is Hudson Foam Plastics Corp. (Yonkers, N.Y.) (CW, May 15, p. 68), which says it currently produces a foam on a commercial scale. Skeptical competitors think,

however, that Hudson is importing the product from Germany.

Hudson could settle the point by letting outsiders see actual production of its product, Permafoam. However, Hudson's head Oscar Shuffman, says it isn't possible yet.

The foam is listed in the latest Sears, Roebuck catalog — out just seven weeks. There sheet stock, for mattress pads and upholstery, is offered. Sears, in its Chicago labs, has tested the product, says Hudson's claims—on fire resistance, insulating properties, sewability, etc.—are understated, if anything. The one drawback now, says Sears: its price.

Licensing Maze: Such pats on the back, however, haven't enabled Hudson to clarify the polyurethane foam situation. Hudson says it has its own patents (pending), and licenses from no one. But every other firm interested in the foams is faced with deciding whether to license from Mobay, Du Pont, or even both. Here are the few available facts in the clouded situation:

Mobay has not issued any licenses yet, "expects to do so within 30 days." In the meantime, some rubber firms (e.g., Goodrich) admit having licensed from Bayer. From non-Mobay sources, it's reported that a Mobay license will cost \$40,000, and some nine companies are in line for the permits.

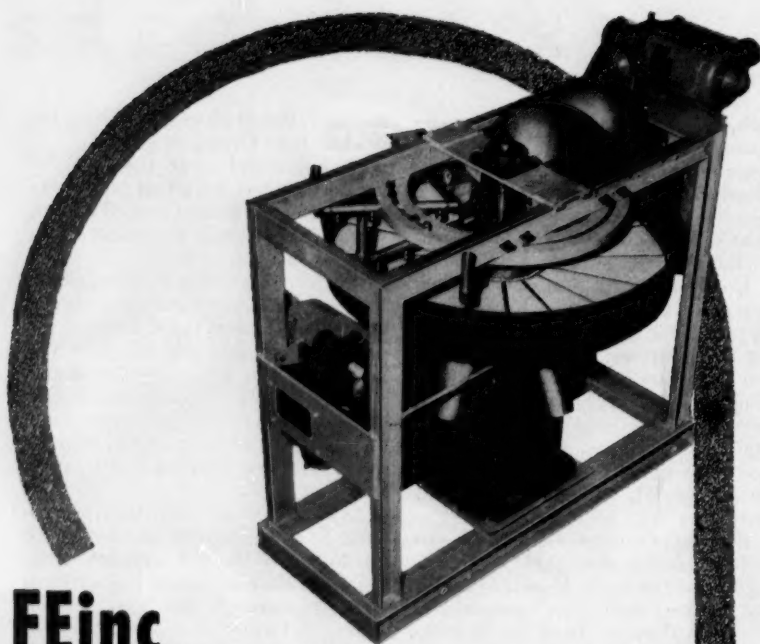
Mobay denies there is any basis for either of these reports. It adds that a company could manufacture the foams without a license from Mobay, provided the company's process equipment and products do not infringe



MOBAY'S EYNON: A plant site and licensees within a month, and production in a year or more.



HUDSON'S SHUFFMAN: His plant is under wraps, but Sears extols his product.



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SPECIALTIES

patents granted to Monsanto and Bayer and subsequently assigned by both to Mobay. Furthermore, Bayer will no longer license directly, but through Mobay.

Still seeking a site for its polyester and diisocyanate plant, Mobay hopes to have that settled by Oct. 1, have its plant onstream within 12-18 months. Until then, Mobay President David Eynon tells CW, "raw material for isocyanate foams will probably be in short supply."

Basic Position: Du Pont, in contrast with Mobay, tells CW that it has licensed several firms to make polyurethane foam. To the important question, "Can a company make the foam without a Du Pont license," comes a terse, "Our patents are basic."

And expanding this: "We are not aware of any patents other than ours that broadly cover the manufacture of polyurethane foams, although several other companies have patents directed toward specific processes and compositions." This, indirectly, pretty much answers the question.

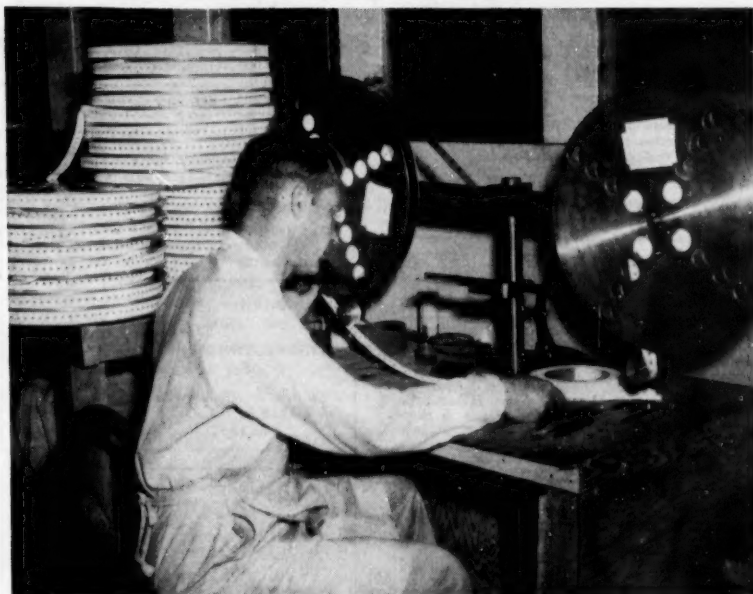
Despite its closely competitive position with O-Cel-O, Du Pont reports it has no present intentions to manufacture the finished foam.

Besides patent confusion facing specialties makers, there is the aforementioned supply problem. Diisocyanates could be imported from Germany. But prices will be stiff until the raw materials are made here—they vary now from \$2 to \$4. And imported foam has a 25% duty levied on it.

Despite the import duties, the disconcerting patent situation, and the supply woes, specialties makers have every reason to view polyurethane optimistically. Their applications as foams, as coatings (possibilities here have whipped up interest by top paint-makers) and films that are expected to compete with cellophane and polyethylene, far outweigh the hindrances that are currently hobbling their widespread use.

Wax Works: A new slabbing machine has been installed at the Chanute, Kan., plant of Warwick Wax Co., which, the company says, results in wax slabs of an apparently lighter cold color than those previously obtained by slow cooling of wax in open pans. Other claims: the slabs are easier to break, melt more rapidly. Warwick's waxes will be produced in 10-lb. rather than 20-lb. slabs.

• Also at its Chanute, Kan., refinery, Warwick is producing Polymekon Wax, a chemically modified microcrystalline wax, on a commercial basis.



CAP RIBBON: Ignitor for self-lighting cigaret is made on tape, then fed to . . .



CAPPING MACHINE, which clips disc of ignitor from strip, glues it to cigaret.

Matchless Smokes

"Gotta match, Buddy?" will soon be an outworn phrase if the Commercial Tobacco Corp. (San Carlos, Calif.) has anything to say about it. For Commercial has just begun marketing Spotlight, a cigaret with a built-in ignitor.

As Frank Witt, president of Commercial and inventor of Spotlight has learned, a self-lighting cigaret involves more than just attaching a match to a cigaret, and a striking pad to the pack. There must be some way to make the

cigaret draw automatically, a way to confine the flame of the ignitor, and a way to eliminate the taste of burning sulfur.

Witt figures he's got these posers answered. Even in the wind or wet, he claims, his product will work. The cigaret is "struck" on an abrasive strip on the package—a special chemical shield separates the lighting cap from the tobacco, and produces the slight suction that provides the necessary

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Spotlight went on sale in the San Francisco area July 21, and will be sold in major California cities by year's end, followed by national distribution.

Fresh Start

The changeover was completed this week at the big agricultural chemical facilities at Fairfield, Md., recently acquired by Food Machinery and Chemical Corp. The 105-acre works, formerly part of U.S. Industrial Chemicals Co. (division of National Distillers Products Corp.), is now officially operating as the Fairfield Chemical Div. of FMC. (FMC bought the Fairfield plant from USI last January).

There'll still be familiar faces at Fairfield—Russell Stoddard is continuing as general manager, and John Rodda as sales manager. Jack Vernon, from Food Machinery's Niagara Chemical Division, is the FMC vice-president heading up the new group.

It has been about a dozen years since FMC decided to try the chemical business, at which time it acquired Niagara. Since, it has added Westvaco and Ohio-Apex, and shared with National Distillers the formation of Intermountain Chemical Co. (to operate a trona mine in Green River, Wyo.). Chemical sales were about \$4 million back in '42; now, with Fairfield to swell the total, FMC expects chemicals sales to be about \$110 million in '54.

The Fairfield Div. gives FMC a greatly boosted interest in agricultural chemicals. The facility is best known for its production of Pyrenone products—based on pyrethrins synergized with piperonyl butoxide (which it makes, too). It also has the first plant specifically designed for allethrin production, and is turning out sizable quantities of the carbamate herbicides, IPC and Chloro IPC. In addition, a number of other carbamate products are showing intriguing possibilities, may be on the chemical scene in big quantities before long.

Jack Vernon hinted at some new

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SPECIALTIES

uses for the carbamates—jobs besides those of eradicating weeds. Chloro IPC has been shown to slow down potato sprouting in storage, for example, and IPC can be used to chemically "thin" peaches so that maximum yields can be obtained.

Heat Saver: Ceramic products can be fired at lower temperatures or for shorter periods by use of a new body flux called Vitromix, its maker, Vitro Manufacturing Co. (Philadelphia) claims.

Animal Aerosol: Bostwick Labs. (Bridgeport, Conn.) sells a 10-oz. aerosol, called 5-Way Pet Kleen. It's for cleaning dogs and cats without using water, is also said to deodorize, relieve itching, kill fleas. Price: \$1.49.

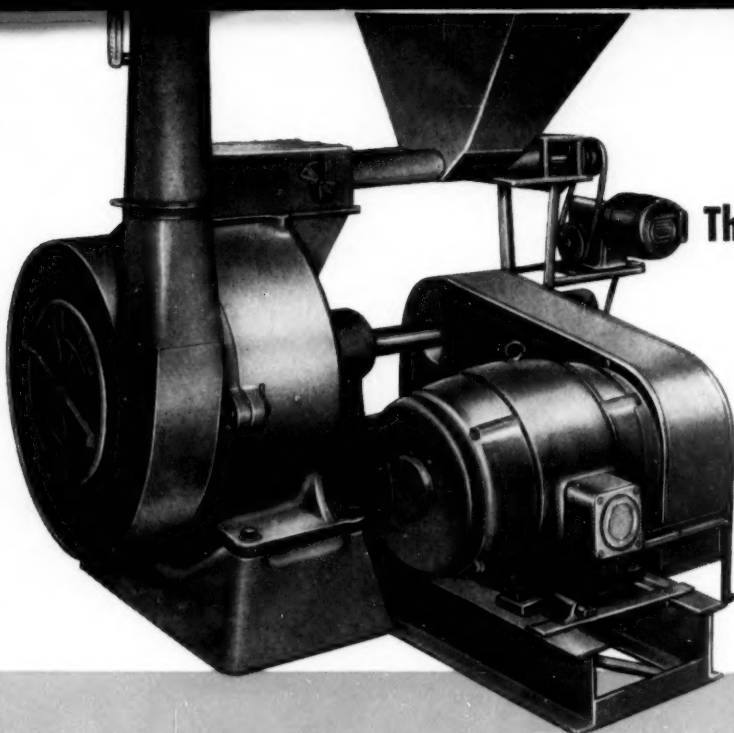
Adopted by Air Force: Skydrol, the CAA-approved fire-resistant aircraft hydraulic fluid, will be used by the U.S. Air Force for the first time in a C-118A plane nearing completion at the Santa Monica, Calif., plant of the Douglas Aircraft Co. Other C-118A's in production and in service will also be converted by the Air Force. Skydrol was developed jointly by Douglas and Monsanto.

Furan Cement: Atlas Mineral Products Co. (Mertztown, Pa.) has started marketing an acid-alkali-resistant furan cement with controlled working and setting times at ordinary temperatures. The product, which consists of a powder and liquid, is mixed on the job.

Shipped In: Nova Chemical Corp. (New York) reports it is marketing the first commercial quantities of caprolactam. Of European origin, the product has been used chiefly in the making of nylon 6. The company expects that its availability will bring about new applications.

Two-Tone Tablets: Arner Co. (Buffalo) is now turning out medical tablets in two colors on a mass production (42,500 hour) basis. Specially fitted compressor machines can make the tablets, which, for example, might contain drugs that would not be compatible in a homogeneous mixture.

Surface Soother: An anesthetic for the skin, said to have low toxicity and low sensitization, is now marketed by Abbott Laboratories. The drug, Tronothane, is a prescription item, is available as jelly, cream, lotions. Active compound is 4-n-butoxyphenyl gamma-morpholinylpropyl ether.



The new

Superfine

SCHUTZ-O'NEILL PULVERIZER

backed by
60 YEARS
of experience

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Here is a proven, automatic and dustless method of pulverizing any grindable material to your desired fineness. For extremely fine grinding and uniform particle size distribution of product, the principle of centrifugal impact with air attrition utilized so efficiently by the Schutz-O'Neill "Superfine" Pulverizer has never been surpassed. The centrifugal force recirculates coarse particles within the mill for regrinding. The air classification carries the fine particles out of mill as uniform product of the desired particle size.

ADAPTABLE TO THE COMPLETE RANGE OF PULVERIZING FROM COARSE TO ULTRA FINE

The ease of grinding and the versatility of the unit are two features not found in any other pulverizer on the market. With proper adjustments, this mill will produce particles from 40 mesh to low micron sizes under conditions that enable you to accurately control not only particle size but also the size distribution in the product. This can be done while maintaining grinding temperatures below 125-130°F. The mill is ordinarily set for fine powdering duty, but if a coarser product is desired, it can be readily obtained by proper adjustment in the grinding and classifying chambers.

COMES APART IN 10 MINUTES,

EASY TO CLEAN, ADJUST, REPAIR

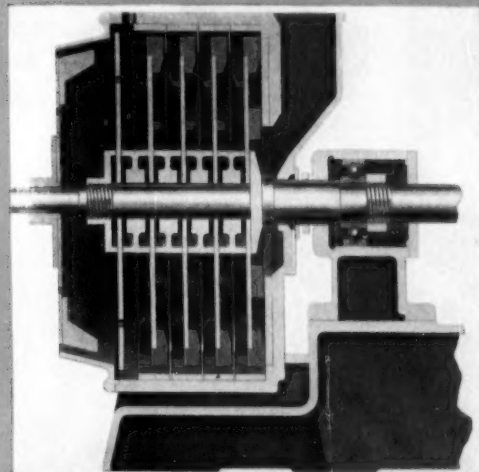
Ten minutes is all you need to take apart a Schutz-O'Neill "Superfine" for cleaning, to adjust for fineness, or replace any part. Remove 2 pins and cone housing lifts off. Loosen 1 set screw and 1 nut and all other parts slide right off the center shaft. It is unmatched for accessibility and simple, rugged design.

LET SCHUTZ-O'NEILL GRIND A TEST SAMPLE FOR YOU

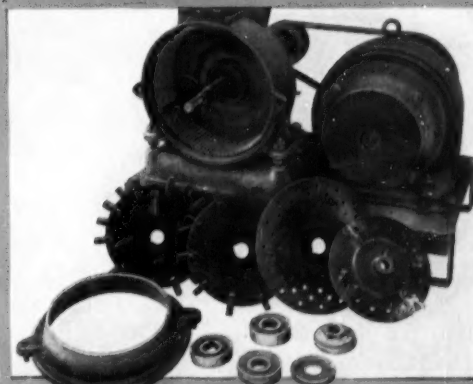
Send us a 50 lb. stock sample stating what your material is and fineness desired. You will receive your pulverized stock plus our engineering report giving complete details of process used together with recommended equipment, methods and mill plans.

WRITE US FOR THE NAME OF SCHUTZ-O'NEILL

SALES ENGINEER NEAREST YOU.



Cross section of the grinding chamber of our "Superfine" Pulverizer showing from left to right the cone plate, perforated mill plate and 4 boiler plates with multi-section liner divided by annular rings.



Here is a disassembled mill. Every part separated and accessible—corrugated liners exposed for easy cleaning, exchange or replacement.



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- **HIGH IONIZATION CONSTANT**— 2.14×10^{-4} —one of the strongest organic acids (approximately 12 times as strong as acetic acid). Permits efficient adjustment of pH over wide range.
- **LOW MOLECULAR WEIGHT**—46.03—smaller amounts of acid are required for neutralization, resulting in economies.

Heyden Formic Acid can be advantageously employed in the dyeing and finishing of textiles, the tanning and dyeing of leathers, for coagulating rubber, for organic syntheses, and as a raw material for the manufacture of drugs, odorants, fumigants, catalysts, plasticizers and water-proofing compounds.

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•
Heyden SODIUM FORMATE—a high quality, uniform product extensively used in tanning leather, making water-resistant wallpaper, and in dyeing and finishing of textiles. Shipped in 50 lb. multiwall paper bags.

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